The Veterinary Record.

(*Founded by William Hunting. F.R.C.V.S.. 1888.*)

No. 52. DECEMBER 26, 1925. Vol. 5.

Foot-and-Mouth Disease as seen in Austria.*

By Major-General Sir John Moore, K.C.M.G., C.B., F.R.C.V.S.

It is customary for Presidents elect to give an address. Usually this partakes of the nature of a mixture of ethics and professional progress. I intend to vary proceedings, and to take as my theme for discourse, "Foot-and-Mouth Disease as seen in Austria." The subject, perhaps, is appropriate at the present time, as so much public attention is centred in this baffling disease, and the reputed, though now discredited, discovery of its cause by Frosch and Dahmen, two German experts, is still fresh in our memories.

The occasion of my visit to Austria in July, 1924, and again in May of this year, was to watch, in a private capacity, the trial of a preventative which the promoter had referred to the Ministry of Agriculture. The preventative owed its origin to a veterinary surgeon practising in Vienna, a graduate of the Tierarzt.-Hoche-Schule, Vienna. The understanding was that ten healthy cattle should be subjected to treatment by the substance, ten similarly healthy cattle used as controls untreated, and two cattle suffering from foot-and-mouth disease in the febrile stage introduced amongst the total. When arrangements for the test were completed, I was to be called over by telegram to watch proceedings and to report, and I was also to be given the opportunity of inspecting both healthy and diseased animals prior to the test.

In due course I was called to Vienna, arriving 19th July, 1924, to an outbreak at Schwecket, ten kilometres from Vienna, in seven milk cows in which three cows standing on one side of an affected animal and treated with the preventative had remained free, while three cows on the other side untreated had contracted the disease. Records were very well kept by the communal veterinary surgeon in charge, but, as the outbreak had then been in existence eleven days before I saw it, I regrettted I could not give any opinion on the preventative for or against. The visitation of the disease, from all appearances, had been a very mild one. Pigs on the premises were not affected. Two days afterwards, *viz.*, on 22nd July, 1924, I was taken to the village of Franzensdorf, about 20 kilometres across the Danube, where the veterinary surgeon in charge had reported an outbreak of the disease in a herd of twenty cattle, comprising nine cows, four heifers, and seven calves. Five animals (all milking cows) were found affected, three being in the febrile stage, and it was decided to test the preventative in the herd. A group of two 2¼ year old heifers, an old dry cow, and a milking cow was selected for the test, and for control a group of two young heifers and a milking cow was also arranged, all these animals showing no visible signs of the disease. Into the centre of each group and in the same part of the cowhouse, was placed a cow actively suffering from the disease. The first or test group received 100 grammes of the preventative internally immediately and had their muzzles and feet smeared with the preparation. The dosage and application were repeated twice the following days, and records of temperature were kept on special forms. On the morning of the 24th July, that is, within 48 hours, all the animals in the cowshed were found suffering from the disease with the exception of the old dry cow, a calf four days old, and a four-months-old calf. The test of the preventative fell to the ground for the reason that it was conducted in the midst of an outbreak, where it was safe to say that almost all the animals had the disease either in an apparent or in an incubative stage. The promoter was disappointed at the result, but I had to explain to him that the only way to put the preparation to the test was to do as suggested by the Ministry of Agriculture and myself, *viz.*, to have certified free groups of animals for treatment and control ready before diseased animals were brought amongst them. By treating animals in a grossly infected place the test was practically reduced to one of a curative nature. I was asked if I would go over again if this could be arranged either in Austria or in Switzerland, and I consented. My second visit to Austria was the outcome; but before dealing with that portion I should like to make a few remarks incidental to the disease on my first visit. Nothing could have exceeded the kindness and courtesy with which I was received. Convenient outbreaks were notified by the Veterinary Administration of Lower Austria to the promoter, so that trial of the preventative could be made, and the veterinary surgeons employed in the outbreaks were careful, capable and attentive. Treatment of affected animals, as you will be aware, is the rule, the policy of slaughter not being adopted, and in the above instances records of symptoms, temperatures, appetite, milk yield, etc., were recorded on a special form. Notification of outbreaks is, of course, compulsory, premises are placarded, and movements of animals out of or into infected premises are prohibited. Milk of affected animals is thrown away; that of unaffected animals on premises is sold after sterilisation. The rules of disinfection and declaration of freedom commonly observed are in force. The young farmer at the latter outbreak treated the matter very philosophically; said he would have a family rejoicing when he was again free. He and his brothers and sisters played various musical instruments, and they would celebrate the occasion by a concert—a happy

* Presented to the Central Division on Thursday, December 3rd, 1925.

ending to an unfortunate circumstance. There was no apparent difference in the intensity of the disease from that observable in England, but it is more intense than that encountered in India. One in-calf cow was very distressed: temperature 104·4 F. (temperatures are Celsius or Centigrade in Austria), blowing heavily, and a certain amount of delirium. Two days after, her temperature was practically normal, and she was quite easy in herself. In the district of Floridzdorf, in which the latter outbreak occurred, I ascertained that case incidence in individual outbreaks was usually 60 per cent. to 70 per cent. for cattle, 20 per cent. for pigs; 40 per cent. for goats, and for sheep nil, for the reason that there are few of them. The percentage of attack in the outbreak described above was 85 per cent. The farmer kept thirty pigs, of varying ages, and three litters a week old, and none was attacked.

In obedience to my promise to the promoter to go over again if he could make satisfactory arrangements, I received a call in May last, and went over on the 18th, arriving midnight 19th. On this occasion there was no doubt about his arrangements: they were perfect, and he spared no trouble **and** expense to make the test complete in every detail. He purchased thirty head of cattle from a district in Upper Austria, certified by the district veterinary surgeon on 18th May to have been officially free from foot-and-mouth disease for two years, had them conveyed by train direct to the quarantine location of the Vienna slaughterhouses specially engaged for purposes of the test. In addition to myself, he secured the services of Dr. Reisinger, Professor of Catttle Pathology at the Veterinary High School, Vienna, and Dr. Weissenrieder, the Chief Veterinary Officer of the Province of Berne, in Switzerland, to carry out the test. On unloading from the railway trucks at 8 a.m., on the 21st, the animals were carefully examined by Dr. Reisinger and myself, described, weighed, and put into the stables Nos. 2 and 3 of the quarantine location I have prepared a rough plan of these two stables, giving the several numbers of the animals and their positions in the stables so that you may readily follow my remarks in regard to the interesting developments of the disease which I now have to relate. The cattle were of the breeds Simenthaler and Pinzgauer, in very good condition, and comprised young bulls from 10 months to 2 years old, and cows up to 7 years, the collection being very suitable for the test. They were grouped into four groups, *viz.*:—

(*a*) Treatment with the preventative for 48 hours, before introduction of disease, dosage being 110 grammes morning, noon, and evening:—Nos. 19, 24, 14, 29, 8.

(*b*) Treatment for 24 hours, similar dosage:—Nos. 9, 16, 1, 22, 23.

(*c*) Treatment immediately before introduction of infection into the stables:—Nos. 21, 13, 15, 2, 3, 11, 18, 17, 10, 20.

(*d*) Controls, untreated:—Nos. 12, 6, 5, 7, 25, 30, 28, 26 (4), (27).

Treatment of Group (*a*) began on the morning of the 21st May, and that of Group (*b*) on the morning of the 22nd. At first, a difficulty in obtaining a suitable diseased animal presented itself, but fortunately, a diseased cow, 8 years, was found in the slaughter yards by the veterinary staff of the institution on the 23rd, and was introduced into No. 2 quarantine stable amongst the animals at 7 p.m. The symptoms shewn by the affected animal were as follows: Temperature, 7 p.m., 105·4°, in nose a few small vesicles, outside nose one large vesicle size of bean, fresh erosions on upper lip and dental pad, one large erosion on tongue near tip, towards left side of tongue vesicle size of chestnut, examination painful; right posterior teat commencing vesicle at orifice, an erosion size of pea, 1 cm. above point; vesicles between claws of fore feet, unburst in near fore, burst in off fore, inflamed but not painful, no lameness, reddish at heels.

From this animal Nos. 4 and 27 of the control group, both two-year old bulls, were infected specially at 7-15 p.m. same day by rubbing their mouths with saliva from the affected cow.

The results were then as follows:—

25th May.—At 8-45 a.m., No. 27, one of the specially infected, shewed symptoms in the mouth, and high temperature, that is, in 38 hours after infection. At 6 p.m., No. 4, the other specially-infected animal, shewed a vesicle on the dental pad and a temperature of 104·4°, i.e., at the 47th hour. No. 7, a control in No. 2 stable, same stable as affected cow, contracted the disease naturally at the 47th hour.

On this day, a second diseased animal, a heavy four-year-old Simenthaler bull, was discovered in the slaughter yards and was sent over to the quarantine yard specially by the veterinary staff. He had a temperature of 104 degrees, erosions dental pad and upper lip, erosions nostrils, fœtor of breath, feet bad and painful, champing jaws and saliva profuse—a bad case. He was placed amongst the animals under test, and the plan of diseased animals, treated animals and control animals re-arranged.

26th May.—By 6 p.m., No. 9 of the 24 hours' treatment group shewed mouth lesions and a temperature of 104.3°. No. 20 in the immediate group had a temperature of 105.4°, and a large vesicle on the dental pad; and three of the control group (Nos. 30, 5, 7) were diseased.

27th May.—8 a.m., the following shewed high temperature:—

Group (*a*) 48 hours' treatment: Nos. 19, 24, 14, 8.
,, (*b*) 24 hours treatment: Nos. 9, 16.
,, (*c*) Immediately before: Nos. 20, 10, 17, 11, 18, 15, and 3.
,, (*d*) Control: Nos. 30, 28, 6, 5, 7.

And by 6 p.m. the following were positive cases:—

Group (*a*) Nos. 19, 24, 8, 29, with No. 14 doubtful.
,, (*b*) Nos. 9, 16, 1, 23, with No. 22 free.
,, (*c*) Nos. 20, 10, 17, 11, 18, 15, 2, 3, with No. 21 free and No. 13 doubtful.
,, (*d*) No. 30, 28, 26, 6, 5, 7, with Nos. 25 and 12 free.

So that by the fourth day, or in 95 hours from the introduction of foot-and-mouth disease amongst them,

16 of those treated were affected.
6 of the controls were affected.
2 were doubtful.
4 were free (2 being controls).

28 total.
2 infected specially.

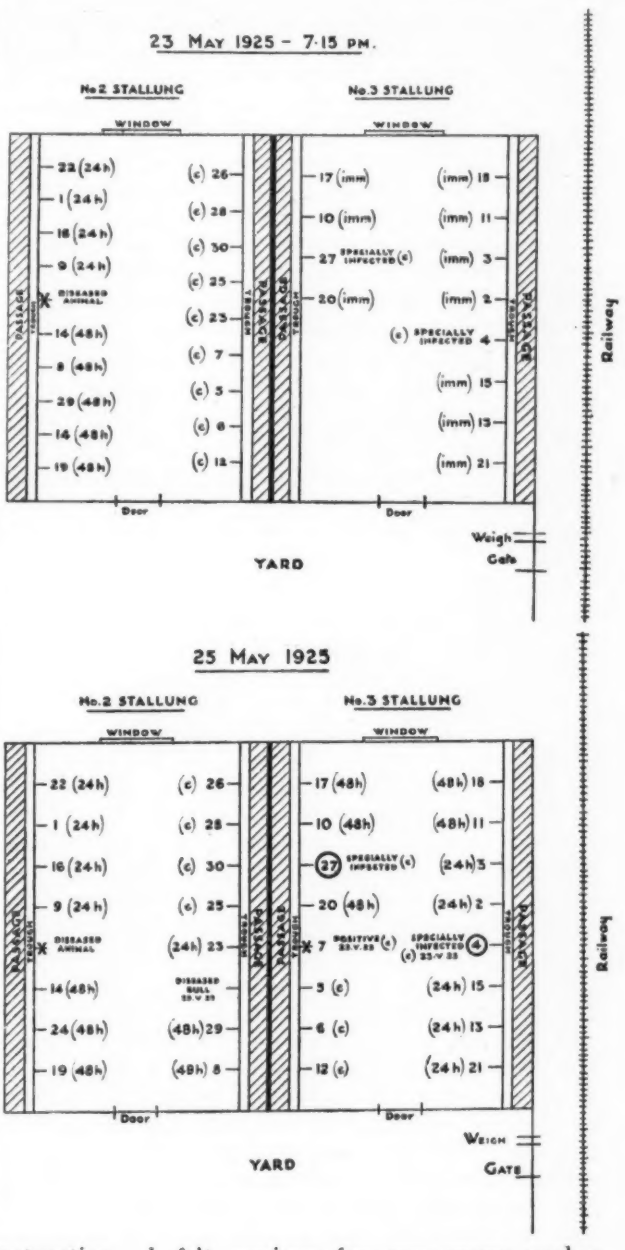
30 total.

The large bull died on the 27th, and I saw the *post-mortem*. Death was from myocarditis, the lesions of this being quite discernible. He had erosions in the pharynx and larynx and in the rumen similar to what was commonly observed in the cuticular portion of the stomach of horses which had died or had been destroyed in cases of contagious stomatitis which prevailed so heavily in France during the war.

Apart from the complete breakdown in the preparation as a preventative against foot-and-mouth disease, the above is a fine example of rapidity of infection, and remarkably illustrates what we veterinary surgeons are up against in the control of this disease. It is difficult to imagine any preventative excepting the absolute barring out of the disease. My conception is that a chemical agent has just as much chance of prevention as a biological extract. Through the courtesy of the chief of the Veterinary Administration of the State of Austria I paid a visit in 1924 to the Government Veterinary Laboratory at Mödling under Professor Gerlach. A serum is there prepared from the blood of affected animals, but it is effective in prevention for ten days only.

Considering this and the fact that, as Professor Reisinger informed me, there are cases on record in Austria of animals contracting the disease naturally as many as four times in one year, where would appear to be the value of biological extract prevention? Whether we shall fare better when the actual cause has been discovered and empirical methods of prevention put in the background, remains to be seen. From the experience gained on this occasion, and duly considering our present incomplete knowledge of the tactics purusued by the disease in causation and dissemination, I am further still convinced that our policy of slaughter and absolute barring of the door in the face of the disease is the best after all. I have before me a statement prepared by our Ministry of Agriculture of the prevalence of foot-and-mouth disease in Continental countries for 1923 and 1924. It is unhappy reading, and one can conceive that it does not represent the total that exists, for in countries where it is enzootic a portion of it is bound to be missed. The split-up of Central Europe into so many small countries, I should say, also tends to a loosening of control.

In the outbreak I have just related Professor Reisinger took advantage of the occasion and brought his college class to the quarantine location for



instruction. I felt envious, for our young undergraduates who never get a chance of seeing the disease in real clinical form—a great drawback where ability to diagnose in the early stages is so important.

Discussion.

The President (Sir John Moore): If anybody would like to ask me any questions, I should be delighted to answer them. I did not mention it in the paper, but I have before me a map of Vienna and district, and I can trace the connection between the first outbreak and the other outbreak, witnessed in 1924. They were on opposite sides of the Danube. It is quite easy to see that one probably resulted from the other. The incidence case in the outbreak witnessed in 1925 was 86.6, after 95 hours.

Professor G. H. Wooldridge: May I propose a very hearty vote of thanks indeed to our President

for the most interesting and instructive address he has given us. It is not customary for a Presidential Address to be open for discussion, but as, under the present circumstances, you have invited questions, I hope that the members present will take advantage of your offer to give them any further information for which they may ask. The breaking away from customary usuage on your part is, to me at any rate, a very welcome one; because, after all, in the ordinary type of Presidential Address one feels that one is just repeating what has been said, or, at any rate felt, by almost every occupant of the chair.

In this instance we are particularly favoured by the fact that you have had this recent experience on the Continent, and we are specially grateful to you for having given us the benefit of your experiences. (Applause.) We get far too little first-hand information of this sort, and to get it from you, who have made a special journey to acquire it, lends it added value.

There are one or two things which have occurred to me as of peculiar interest and I think that perhaps they should be emphasised: Some of the conclusions, which you yourself drew and to which you referred in terminating your address, with regard to the value of either chemical or biological agents in the prevention of this disease. If it is the case—as has been stated by you—that cattle may contract the affection four or five times in the course of one year, it is obvious that one attack leaves very little immunity, and that, therefore, the prospects of an immunity being produced in any strength as the result of sera of any other type of hyper-immunisation do not afford the same scope as in some other types of microbial affections. That experience, however, ought not to prevent further experimentation in the field even though it will, perhaps, put a damper on the ardour of some of the workers. A point of interest to me was the rates of the incidence of the disease in some of the different species. I note that 20 per cent. was the incidence in pigs and 40 per cent. in goats. There is an idea which has been spread in this country, without foundation, that goats do not contract foot-and-mouth disease, or that, if they do contract it, it is so very, very mild that it is of little importance. Certainly outbreaks of the disease have, in many instances, involved the slaughter of goats, but for a large proportion of those cases it is true to say that they have been slaughtered simply because they have been in contact. But an incidence of 40 per cent. in the field of your test should very effectively give an answer to those who suggest that goats have a very great resistance to the disease

I would ask for information on two points: Can you give us any information (and on this point I am quite prepared to be faced with an intimation of inability on the ground of the disclosure of a secret) as to what is the nature of the preventive agent which was used? The probability is that it has not been divulged, however, and that would be a pity, because the agent may have suggested itself to other people, and it would be as well for them to know that it would be a waste of time to put it to further test The second question is the name of the maker of the material, because people who have not been able to investigate the agent get names handed to them, and if we know the name of the maker of this preparation, if his name is again mentioned in connection with this so-called specific, we can say it has been given a trial and has been found wanting.

In conclusion, I would like again to voice the thanks of the Society to you for the most interesting and instructive address you have given. (Applause.)

Lieut.-Colonel T. D. YOUNG: I should like to take the opportunity of seconding this vote of thanks. I am sure we are all deeply grateful to the President for the trouble he has taken in preparing the paper he has given us to-night. (Applause.)

I should like to draw attention, particularly, to the difficulty of diagnosis. As one who has had some experience of this disease I thoroughly agree with him in that. In this connection I would like to draw the attention of the profession to a paper read by Mr. A. Holman Berry, before the Midland Counties V.M.A., at Birmingham, on May 14th, 1918, and published in the *Veterinary Record* of June 8th of that year. It is entitled "Some Remarks on Foot-and-Mouth Disease and other Diseases in relation to Differential Diagnosis," and contains so much valuable information in regard to this important matter that I think it might well be reproduced in the *Record* for the guidance of the profession to-day. (Mr. Berry's paper will appear in an early issue.—Ed.)

Coming to the question of the degree of immunity produced by an attack of the disease, I can corroborate what the President has said to-day, because, while in South America, I found it was quite a common thing for cattle to be re-affected once or twice in one year; that, again, will be corroborated by our valued friend, Dr. Richelet.

Professor Wooldridge said, I think, that if an initial attack of the disease would not produce immunity, vaccination would be useless. It may interest some of you to know that, in last month's *Révue Générale*, there appears a short article by Vallée on this subject, in which he states that vaccination with blood from animals which have been affected produces practically no immunity at all. On the other hand, if portions of epithelium from the lesions in the mouth are taken and broken down and are carefully mixed with a physiological salt solution, and given in very big doses they have had successful immunity against subsequent inoculations with the disease in eleven cases. He points out, however, that vaccination against the disease as a preventive measure must not be ruled out of court. It may be that in all the vaccinations tried, including the natural infection, the attack may be so mild that it has no value from the point of view of the production of immunity, and it is to be hoped that the experiments carried out by Vallée may be of use. It is interesting to hear that lesions of the disease may be found in the rumen, and that the disease, as seen in Austria, simulates the contagious stomatitis we had in horses

in France. It makes one wonder if those cases were not mild cases of foot-and-mouth disease—it certainly was very contagious.

Dr. RICHELET corroborated Colonel Young's remarks in regard to the recurrence of foot-and-mouth disease in the same animal in the course of a year in South America.

Lieut.-Colonel RAINEY asked the President if Dr. Reisinger, who was, apparently, a great authority on foot-and-mouth disease, had discussed with him the policy adopted by our Ministry of Agriculture, and, if so, what was his opinion of it.

With regard to Colonel Young's remarks concerning contagious stomatitis in France, they had the same condition on a large scale in Canada, where there was no foot-and-mouth disease, which would appear to rule out the contention that there existed a relationship between the two diseases.

Lieut.-Colonel YOUNG requested that Dr. Max Berg might be asked to contribute to the discussion on that subject. They all looked, he was sure, to Germany for progress in regard to scientific research into disease.

The PRESIDENT: I have a note from Major Hobday asking me to be sure that Dr. Berg says a few words to us.

Dr. MAX BERG said that it was his earnest desire, although he was not a great linguist, to give expression to his sincere gratification at having been honoured by the Society's invitation to attend that meeting. He thanked the President and the Fellows most heartily for their very kind welcome. He had, as a medical man, interest but no experience in their special science, and he could not remember ever having seen a case of foot-and-mouth disease. But he wished to say that he had been most interested in the proceedings at that meeting, for he was attracted by comparative medicine. He considered comparative medicine to be a most important factor which must lead to the improvement of both sections of medical and veterinary science. He was going to stimulate his Berlin friends to lay great stress on that particular section of science. He took the invitation, and the welcome that had been accorded him that evening, as a most satisfactory proof that the spirit of Locarno was going to be a real and dominating factor in international relationships, and he thanked them most heartily for their goodwill. (Applause.)

He thought that both their countries—as they always did in former and better days—should work together again and combine their efforts to improve and advance the sciences.

Capt. E. C. WINTER: With reference to contagious stomatitis in horses, I gather that you said, Mr. President, that the disease was much more acute in France than we had it in Canada. I had to deal with an outbreak in Montreal, and although similar to foot-and-mouth disease, the disease was very mild, there being no fatal cases, most being quite all right within a month after simple local treatment of the mouth. While it was highly contagious, it did not appear to do very much harm. I presume, however, from what you said, that you had it in a very much more acute form in France.

THE PRESIDENT'S REPLY.

The PRESIDENT: We are, I am sure, very delighted, not only to have Dr. Berg here this evening, but to hear from him such nice expressions. I am certain that the old feeling between the two countries, which began in 1914, will die away, and that the spirit of Locarno will indeed rise supreme. At least, let us hope so, and, looking at it from the point of view of medical and veterinary science, I am sure that we in this room and, indeed, in the whole of the veterinary profession, will wish it so. Very shortly, within the next few years, we hope to have an International Veterinary Congress. It should have taken place in 1914; the war stopped it, but it is on the tapis again, and we hope to bring it off in the course of another couple of years. We trust that our German confrères in the veterinary profession will be represented: I know it will be so as regards Austria. As a matter of fact, Dr. Reisinger and Professor Schmidt, of the college at Vienna, were on their way to our Congress, and Dr. Hutyra actually arrived. In the interest of veterinary science we think that this Congress should be held, but it will not do any good at all unless it is absolutely international in character. I am sure we shall give the German and Austrian representatives a very warm welcome. Dr. Reisinger is certainly coming over. Dr. Reisinger is the Professor of Cattle Pathology at the Veterinary High School in Vienna—he is not a government official. The policy of all Continental countries in dealing with foot-and-mouth disease is one of treatment and not of slaughter, and I do not know what they think of our policy. You can only really carry out the slaughter policy in an insular country like ours—I do not think it is practicable where frontiers are land frontiers, and it is a most difficult position on the Continent, where there are now so many.

Professor Wooldridge asked some very pointed questions. First of all, about the incidence in species. The figures that I quoted were given to me by a very shrewd veterinary surgeon who handled one of the outbreaks, Dr. Katz, who used to be house surgeon under Professor Reisinger. The 40 per cent. in goats was entirely his idea. We have no means of finding out in this country, as we have so few goats, but there is no reason, to my mind, why goats should not be affected to that extent. I have never seen any foot-and-mouth disease in goats myself, even in India, so that I conclude that it does not prevail in goats there to the extent that perhaps it would do in other countries.

It seems extraordinary to conceive of a preventative biological agent, as affording immunity for a long period when you find the disease itself failing to do so, but I would qualify that remark by saying that, if we discovered the cause and we got to know something about the tactics of our enemy, we might be able to formulate measures which might result in absolute prevention. Professor Gerlach, who was in touch with Dahmen and Frosch, had hopes of something resulting from their discovery.

Professor Wooldridge asked me about the nature of the preventative and the name of the maker. I do not know what to say on that point: I can tell you in confidence, if that will do. It is like every other preventative—it does not matter whether it is a biological or a chemical one in which efficacy as preventive is assumed—it must be in the nature of a proprietary article. If any one brings out an absolute preventative of foot-and-mouth disease, his fortune is made—and a very, very large fortune—and therefore promoters are very careful not to divulge either method of composition. I was asked to report as to the value of this preparation as a preventative: it had no such merit though, in common with many others, it had value as a cure. Personally, I have a feeling that I should not have had anything to do with a proprietary remedy, but I was asked to take it up and I do not think there was any harm in my doing so. (Hear, hear.) As you have seen in the newspapers, we have recently had Dr. Shaw's preparation put forward. It was sent out from Wembley to Ceylon for trial, and, as you will read in the *Record* next week, it entirely failed in its purpose, four out of five animals contracting the disease. In reviewing the report from Ceylon I observed that it made mention of nitric acid treatment: I want to find out a little more about it, and whether Sir Stewart Stockman knows anything about it, either in relation to prevention or cure.

I am glad Colonel Young agrees with me that there is a difficulty in diagnosis, and here, in my opinion, is the most important thing in relation to this disease. It is most necessary to be able to diagnose cases in the very early stages, and I do not see how an ordinary farmer is going to do so, and report it to the proper authority as quickly as he should do. It is of the utmost moment that an early report should be given to the proper authority: the milder the outbreak, the greater the difficulty. There are differences in degree in foot-and-mouth disease: the French say there are two kinds. The colder the climate, in my view, the more prevalent aphthous diseases are. I do not think there is any connection between contagious stomatitis and foot-and-mouth disease, because, as Capt. Winter and Colonel Rainey have both said, there is no foot-and-mouth disease in Canada, and you do get stomatitis there and in the U.S.A., where there is the pustular form, which worse than the vesicular. Colonel Young made a happy reference to the interesting work of Professor Vallée, but, so far as I remember, there is only a very limited period of time in which even blood is infective: if you take blood in the non-fever stage, it is non-infective.

Colonel YOUNG: It is infective after the vesicles are ruptured.

The PRESIDENT: I hope I have not kept you longer than I should have done. I feel it is a very interesting matter at the present time, and I take a great personal interest in all contagious diseases.

Veterinary Inspectors' Section of the Royal Sanitary Institute Congress.

LIEUT.-COLONEL DUNLOP YOUNG'S REPORT TO THE CENTRAL DIVISION.

The thirty-sixth Congress arranged by the Royal Sanitary Institute at Edinburgh from July 20th to 25th, was, in the opinion of those who attended it, the most important yet held. Over 800 delegates attended; in addition, there were over 800 interested persons present. Amongst the delegates were representatives from Government Departments, Overseas Dominions, Foreign Governments, County and City Councils, County and Metropolitan Boroughs, Urban District Councils, Rural District Councils, Port Sanitary Authorities, Joint Boards and Societies, Associations, Universities, etc. I formed the opinion that it is absolutely essential that our profession should be more fully represented than it has been at those Congresses, for the following reason: The Congresses are attended by the chairmen of nearly every health committee in Great Britain, in addition to the medical officers of health, sanitary inspectors, sanitary engineers and other officials; papers are read and discussed by those officials and the chairmen of the health committees naturally look upon their officers as very important individuals. It must be obvious that, if few veterinary officers attend and few papers are read and discussed by them, the chairmen referred to will not consider veterinary officers of much importance and thus we, as a profession, will not be considered necessary officers in the health service, where we ought to take a prominent place in meat and milk inspection. It is only by keeping our profession in touch with the men who have the power to make appointments to health service positions, that we can secure the recognition to which we are entitled.

Amongst the delegates the following names appeared: Messrs. Burndred, Brittlebank, Douglas, Begg, Slipper, Gofton, Howie, Brown, Elphick, Wooldridge, Bradley, Linton, Lloyd, Whitehead, McKinna, Parker, Townson, Trotter, and your representative.

Some of the papers read in the various sections were not very interesting, the subject matter having been dealt with very fully at previous congresses.

Conferences were held under the following headings:

1. Representatives of Sanitary Authorities.
2. ,, ,, Port Sanitary Authorities.
3. ,, ,, Medical Officers of Health.
4. ,, ,, Engineers and Surveyors.
5. ,, ,, Veterinary Inspectors.
6. ,, ,, Sanitary Inspectors.
7. ,, ,, Health Visitors.
8. ,, ,, Health Workers.

The veterinary section was this year considered a very great success. In the opinion of Mr. Hayhurst, Recording Secretary, and Dr. Gerald Leighton, President, it was by far the most important yet held. It was attended by chairmen of health committees, medical officers of health, sanitary inspectors, and veterinary officers. An excellent paper, read by Lieut.-Colonel Brittlebank, C.M.G., M.R.C.V.S.,

D.V.S.M., entitled: "A Uniform System of Milk Inspection," created a good impression on those present, and an animated discussion followed. Amongst those who took an active part were Messrs. Trotter, Lloyd, Begg, Whitehead, Brown, Howie, McAllan and McKinna. Several medical officers also spoke, including Dr. W. J. Howarth, C.B.E., M.D., D.P.H., and Dr. Stenhouse Williams, B.Sc., M.B., D.P.H., Reading, who represented the British Dairy Farmers' Association. Professor A. Gofton, F.R.C.V.S., read a very interesting paper on "The Problem of the Tuberculosis Cow," which was chiefly concerned with the commercial side of the subject of tuberculosis. This paper was well received, and an interesting discussion followed. Amongst those taking part were Alderman Phené Neal (who urged the introduction of tuberculin tested heifers from Canada), Messrs. Brundred, Brown, Lloyd, McKenna, and Howie.

Captain McAllan, M.A., B.Sc., M.R.C.V.S., Aberdeen, read a short but interesting paper on "Common Difficulties in Practical Meat Inspection." Discussion on this paper was opened by your delegate, who congratulated the veterinary profession in Scotland on being accorded their proper sphere similar to that in all countries, England excepted, with reference to meat inspection, urged the *ante-mortem* and *post-mortem* examination of all food animals in abattoirs by veterinary officers, and the appointment of local veterinary surgeons as meat inspectors in country districts where no public abattoirs exist, an arrangement now in operation in Holland and in continental countries. The reader of the paper was urged to arrange for the stamping, after inspection, of Aberdeen meat sent to London, for two reasons:—

1. To show the meat had been officially inspected;
2. To show that the meat is actually Scotch beef, as beef, dressed in Scotch style, is deposited in markets which does not come from Scotland; and
3. It would be a good example for other authorities to follow.

An interesting discussion followed, in which Messrs. Whitehead, Lloyd, McKinna, etc., took part.

At the close of the section, votes of thanks were accorded to the readers of the papers. Amongst those who offered their congratulations were Alderman Phené Neal and Dr. W. J. Howarth, C.B.E., M.D., D.P.H., City of London, the latter spoke of the advance the veterinary profession was making, instancing the appointment of Professor Buxton to the Chair of Comparative Pathology at Cambridge, and the ability of members such as Messrs. Gofton and Brittlebank to place such able and lucid papers before the section.

Visits were made to interesting places, the most important, from a veterinary point of view, being the abattoirs and markets of the Corporation of the City of Edinburgh at Gorgie, where Mr. Howard Jones, O.B.E., M.R.C.V.S., gave a short demonstration on the method of examining carcasses and offal, and the "Iwel" plant for the disposal of condemned meat was shown.

Mr. Hayhurst kindly arranged to have the veterinary papers published in the *Record* (this has already been done). In conclusion, I desire to place on record the great support accorded to the veterinary section by the following gentlemen, *viz.*:—Dr. Gerald Leighton Alderman Phené Neal, and Dr. W. J. Howarth.

At the request of several members of the profession, I wrote to the local secretary, Cambridge, recommending that they be invited as guests to the Congress at Cambridge as a mark of our appreciation and, as most of you know, the two last-named gentlemen attended, and Dr. Howarth kindly proposed the toast of the National Veterinary Medical Association. He also attended the demonstration given by your delegate, and took much interest in the Congress. In conclusion, I wish to thank you for the honour of being appointed your delegate.

Santonin—History and Chemistry.

By Henry Gray, M.R.C.V.S., Kensington.

Santonin, $C_{15}H_{18}O_3$, is not a synthetic drug, but a naturally-occurring principle present in small quantities in santonica, the unexpanded flower-heads of *Artemisia cima*, (Berg) Willkomm. It was discovered independently by Kahler and Alms in 1829; the first crystalline specimen was prepared in 1830, (*Brandes Archiv* Bd. 34, S. 318; Bd. 35, S. 217; Bd. 39, S. 190). The following year Alms published a detailed report of a further series of investigations on the new substance. He describes the method of preparation, its chemical and physical properties, its composition and empyric formula. He concludes his paper by recommending doctors to try its anthelmintic properties, stating that "initial experiments have proved very promising." Trommsdorff and Liebig promptly investigated the researches of Alms and soon published papers on the preparation and properties of santonin. Within comparatively few years, it became a common medicine in the druggists' shops in Europe, and was admitted to the Bavarian Pharmacopœia. The manufacture on a large scale was first developed in Germany, but it soon became evident that the process could be carried out more economically in the neighbourhood of the area in which santonica grows. A factory was, therefore, erected at Tschimkent in Russian Turkestan, and for nearly half a century this factory has supplied the world's requirements of santonin. The factory is now directed by the Trade Department of the Russian Government and the plant and process have recently been improved to cope with all demands for the pure product. During the last decade attempts have been made to extract santonin from species of Artemisia found in other countries, particularly in India, North America and Mexico; the results have been unsatisfactory, chiefly because the raw materials employed contained no santonin, or only such small traces as could not be extracted by known methods.

The chemical properties of santonin have been investigated by many eminent workers; their findings have received wide publicity in scientific journals devoted to the advancement of chemistry and medicine. However, many authors of chemical text books give astonishingly inaccurate descriptions of the parent body and even fail to distinguish the isomeric forms of its simpler derivatives. Already, in 1873, the independent researches of Cannizzaro and Hesse clearly established the relations between santoninic acid and its isomer santonic acid, yet very recent writers on the chemistry of anthelmintics seem unable to discriminate between these two bodies. Lack of precision in describing the characteristics of the acids naturally leads to hopeless confusion of their salts. One frequently finds, even in the official publications of pharmaceutical societies, that sodium santoninate and sodium santonate are used as synonymous terms. Students are mystified by the ambiguities and contradictions they have to read to obtain a clear picture of the subject; the therapeutic aspect is more serious, because the salts of santoninic acid possess properties different from those of santonic acid. The molecular structure of santonin has not yet been established beyond doubt; it is, therefore, impossible to indicate with certainty the graphic formula. Much discussion has been centred on the position of the ketonic group and the consequent influence on the lactone ring. Italian chemists, led by Cannizzaro, are supported by Wedekind and others in Germany in maintaining that the ketone group belongs to the cyclic system which remains after profound decomposition of the molecule has taken place following distillation with or without zinc dust or barium hydroxide. On the other hand, Klein is of opinion that this ketonic group is shared by the side chain and the lactone ring, occupying a position whereby it influences the motility of the latter. The particular carbon atom on which the lactone ring closes is also a matter of keen controversy; this point must likewise remain und cided until further proofs are brought to light. Cannizzaro's conception of the molecule is the one generally accepted, because it explains the known chemical reactions of santonin more fully than that suggested by other investigators. Although the structural formulæ represented here cannot be accepted as definitely proved, they show the progress which has been made and the gaps which remain to be filled up in our knowledge of the molecule :—

$C_{15}H_{18}O_3$	$C_{15}H_{20}O_4$	$C_{15}H_{20}O_4$
Santonin.	Santoninic acid.	Santonic acid.

The above formulæ indicate the chemical relation and the variation in molecular structure of these bodies. Santoninic acid is prepared by boiling santonin with caustic soda solution forming sodium santoninate; by adding excess of dilute hydrochloric acid the santoninic acid is set free and can be extracted with ether; the ethereal solution yields granular crystals which, on re-crystallisation from alcohol, yield fine white rhombic flakes. In solution, santoninic acid readily decomposes into santonin and water; the same change takes place when the crystals are heated for some time at a temperature of 120° C. Santonic acid is prepared by boiling santonin for twelve hours with concentrated barium hydroxide solution, then acidifying with hydrochloric acid, extracting with ether, and re-crystallising from alcohol. Santonic acid melts at 161°—163° C; it is more stable than its isomer—up to the present all attempts to reconvert it into santonin by removal of the elements of water have failed. Francesconi attributes the stability of this acid to the shifting of one double bond to the side chain owing to the prolonged heating with barium hydroxide. Unlike santoninic acid, santonic acid dissolved in alkalies displays great activity towards diazonium chlorides.

Santonin is the lactone of santoninic acid; it may also be called the anhydride of this acid, although this latter term does not connote its properties to any extent. Unlike alkaloids, it is a nitrogen-free body; the nucleus is supposed to consist of two closed rings condensed together as in naphthalene. In many text books it is classed as a naphthalene derivative, the chief reason for such classification being the derivation of 1 : 4—dimethylnaphthalene by the action of reducing agents or by fusing with caustic potash. There are, however, many facts which show that santonin is not a true naphthalene body. In the first place, the production of dimethylnaphthalene does not proceed quantitatively; a number of other products are set free during the process of reduction or fusion and the yield of the naphthalene compound is relatively small. Its formation may be due to the interaction of the intermediate products and not as the result of straightforward decomposition; since three carbon atoms must always be removed from the santonin molecule to produce a naphthalene derivative, Klein suggests that these three atoms are present in the form of an isopropyl group, but there are no experimental *data* to support this theory. In the second place, santonin gives rise to a variety of oxidation and reduction products of known constitution such as oxalic acid, formic acid, acetone, a tetracarboxylic acid and a number of hydrocarbons; the formation of these substances cannot be accounted for on the basis of a naphthalene constitution. Finally, all attempts to synthetise santonin from naphthalene have failed without showing any hope of ultimate success. The case of santonin is analogous to that of camphor, which does not belong to the benzene series, although it yields benzene on reduction. In the absence of direct evidence, the relation of santonin to other chemical substances can be best understood by the study of the hydrocarbon corresponding to the formula $C_{15}H_{18}O_3$ and by considering the composition of the other substances occurring with santonin in santonica. The corresponding hydrocarbon has the formula $C_{15}H_{24}$, showing that it is a sesquiterpene; by reducing santononic acid with hydriodic acid, Cannizzaro and Amato obtained a hydrocarbon of the formula $C_{15}H_{24}$; Andreocci obtained the same hydrocarbon by treating santonin with zinc chloride and hydrochloric acid. Unfortunately the researches

were never carried far enough to prove that this hydrocarbon reacted in all respects as a sesquiterpene or to establish any theory for its formation. Santonica yields from 2 to 3 per cent. of volatile oils consisting chiefly of the terpene derivative cineol, some terpineol, terpinene, terpenenol and a sesquiterpene; the residue consists of artemisin, which may be classed as a terpene, of a resinous substance and santonin. Thus all the other substances present in santonica belong to the terpene family, whilst the degradation of santonin to a resinous substance by the action of light and mild chemical reagents has long been known. All these facts throw a good deal of light on the constitution of this important vegetable product and seem to show it is very closely related to the terpenes.

Pure santonin crystallises in colourless, flat, rhombic prisms possessing a pearly lustre. It melts at 170°C., yielding a colourless liquid; if the temperature be carefully raised the liquid sublimes without decomposition to colourless needles; on the other hand, if it is slowly cooled the santonin again crystallises, but if rapidly cooled it becomes an amorphous mass. Santonin is only very slightly soluble in dilute mineral acids and in cold water (1 in 5,000), the solubility in water increases with rise in temperature, reaching 1 in 250 at 100°C.; it is soluble in 50 parts of 90 per cent. alcohol at ordinary temperature and in 3 parts of boiling alcohol; it is also soluble in chloroform, ether, oils, and fats; its solutions are strongly lævorotatory. The crystals are practically tasteless, but even dilute solutions have a bitter taste. It is very resistant to oxidising agents; air has no effect on the crystals at ordinary temperatures, but when strongly heated in the air they burn with a sooty flame leaving no residue. Slight exposure to sunlight produces a yellow colour which is not accompanied by any appreciable change in composition, and colourless crystals of genuine santonin may be again obtained merely by re-crystallisation. Prolonged exposure to sunlight, particularly in solution, gives rise to definite chemical changes; thus in anhydrous alcoholic solution, it is degraded to an amorphous resinous substance, whilst in aqueous alcoholic solutions it yields diethylphotosantoninate and very little resin; in caustic potash solution it is converted into photosantonate and photosantoninate, the proportion of the latter increasing with the amount of alkali employed; in hydrochloric acid solution desmotroposantonin and a resinous matter soluble in sodium carbonate are produced. Provided supplies of santonin are purchased from a reliable drug house, there is very little need to doubt the purity; as it leaves the factory in Tschimkent, the product is 100 per cent. pure, being remarkably uniform in quality and appearance. Should the purity of the product be suspected, it can be safely attributed to adulteration after manufacture, which can be detected by the melting point, the alkali and acid colorations and ash tests indicated in pharmacopœias. The drug must be protected from actinic rays and should be packed in opaque wrappings or in amber glass.

As in the case of all lactones, salts of santonin may be prepared either by heating with metallic hydroxides or by the addition of concentrated metallic salt solutions to sodium santoninate. The addition of dilute mineral or strong organic acids to solutions of alkali santoninates sets free santononic acid, which readily changes to the lactone santonin. With hydroxylamine and phenylhydrazine, santonin interacts as a ketone, forming the oxime $C_{15}H_{18}O_2$, NOH and hydrazone $C_{15}H_{18}O_2$ N_2H, C_6H_5 respectively. It forms numerous additive and substitution halogen derivatives of great theoretical interest; with phosphorus pentachloride it forms a crystalline compound having the composition $C_{15}H_{15}Cl_3O_2$. Santonin exhibits the characteristics of an unsaturated compound, in neutral solutions at ordinary temperature and pressure it can take up four molecules of hydrogen; it unites directly with a molecule of nitric acid giving a compound having the formula $C_{15}H_{18}O_3$, HNO_3; it also combines with one molecule of certain metallic salts—for instance, with antimony pentachloride it forms $(C_{15}H_{18}O_3)_2$ Sb Cl_3, HCl. The introduction of nitrogen into the molecule has been studied by Wedekind. The results do not shed much light on the chemistry of the drug. Santonin itself does not combine with diazo-salts but some of its derivatives are readily diazotised, yielding crystalline products.

Chromosantonin.

On exposure to light, especially to direct sunlight, santonin crystals acquire a yellow colour. The coloration is strong evidence of chemical action; Montemartini is of opinion that the change is complete and not merely superficial. The resulting product is known as chromosantonin, an isomeric modification of ordinary santonin; its formation is attributed to the migration of an atom of hydrogen from the methylene radical adjacent to the carbonyl group without any alteration in the lactone ring. Its solubility in alcohol, its melting point and optical activity, are all lower than those of santonin. It yields derivatives which are distinguishable from those of santonin by their yellow colour and different physical properties. The constitution of chromosantonin is not known.

Chromosantonin is apparently an unstable body which cannot be purified by re-crystallisation, for instance, its hot alcoholic solution is yellow, but colourless crystals of pure santonin are deposited on cooling. A similar difficulty is experienced with its simpler coloured derivatives; they yield the corresponding colourless santonin compounds on re-crystallisation. Those derivatives of chromosantonin which contain the same number of carbon atoms and during the formation of which a change takes place in the molecular nucleus, as, for example, santonous and santonic acids, are identical with those prepared from santonin. The chemical reactions of this product can therefore be explained by supposing it to consist of a mixture of unaltered santonin and a degradation product which is the cause of the yellow coloration. This supposition is supported by therapeutic evidence, for the anthelmintic power of chromosantonin is found to be lower than that of santonin. On the basis of

our present knowledge, chromosantonin cannot be regarded as a definite chemical compound.

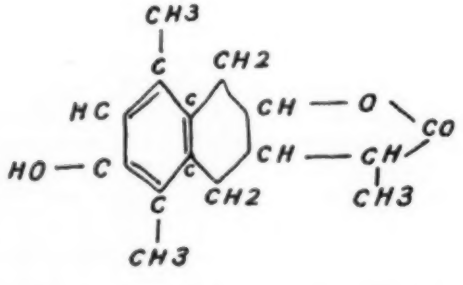
Photosantonic Acid ($C_{15}H_{22}O_5$).

Dibasic photosantonic acid is prepared by exposing a saturated solution of santonin (20 parts) in 80 per cent. acetic acid solution (300 parts) to direct sun rays for a period of one or two months according to the actinic strength of the light. When the action is complete, the dibasic acid is separated by adding water, extracting with ether, and re-crystallising from alcohol. The pure product crystallises in colourless prisms which decompose on heating to 100°C. yielding water and a solid residue which melts at 154°C.

In photosantonic acid the santonin nucleus has been ruptured and two molecules of water have been added; yet photosantonic acid gives with alkalis the same characteristic reactions as santonin. Photosantonic acid is a stable body; its salts can be prepared in the usual manner, and it readily forms isomerides.

Desmotroposantonin ($C_{15}H_{18}O_3$).

This isomeride is prepared by heating a solution of santonin in concentrated hydrochloric acid to a temperature of 60°C. for six hours; to avoid decomposition of the santonin, sunlight should be excluded from the room in which the operation is carried out. Desmotroposantonin crystallises from alcohol in fine colourless needles which are not changed by light and melt at 260°C. It has never been reconverted into santonin, the alkaline salts return very readily to the lactone—for this reason the corresponding acid has never been isolated. Its behaviour towards reagents shows that the ketonic character of santonin has disappeared and has been replaced by phenolic properties. Unlike santonin, desmotroposantonin combines readily with certain diazo-salts, yielding yellow or red crystalline products, all of which melt at temperatures higher than 260°C. On heating with caustic potash to 220°C., it forms the isomer isodesmotroposantonin. The structural formula recommended by Andreocci is:



Compared with santonin, the alteration in molecular structure is represented by the transformation of the group—CO—CH_2—into—COH =CH, the lactone ring remaining unchanged. Desmotroposantonin does not give the characteristic santonin coloration with alkalies.

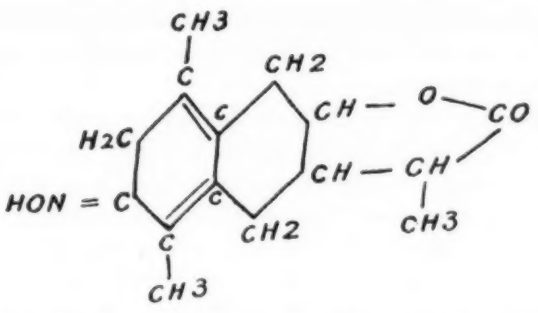
Santonone ($C_{30}H_{34}O_4$).

This lactone has been studied very extensively by Grassi-Cristaldi. It is prepared by gradually adding 6 parts zinc dust to a hot solution of 10 parts santonin in 300 parts of 50 per cent. acetic acid; the reduction is more readily induced in presence of a little platinum tetrachloride. The crystalline deposit is collected, washed with water, dried and extracted with alcohol in a reflux apparatus. Santonone separates from the alcoholic solution in white, silky needles which melt at 223°C.; it is insoluble in water, and dissolves in benzene more readily than in other organic solvents. The concentration of the acetic acid solution used in this preparation is of primary importance, if 70 per cent. acid be used the isomeride isosantonone is produced. Santonone is also obtained by electrolysis of a santonin solution in aqueous acetic acid. The corresponding dibasic santononic acid is formed by boiling a dilute solution of santonone in barium hydroxide for twelve hours. The excess of barium is then precipitated by carbon dioxide and filtered; by adding dilute acetic acid to the clear liquor insoluble santononic acid is precipitated. On re-crystallising from alcohol, beautiful micaceous laminæ are obtained. Santononic acid melts at 215°-216°C. with decomposition; acetic anhydride converts it to the lactone santonone.

Santonone contains two lactone groups in the molecule; the formation of the compound is due to the carbonyl group of santonin being reduced and two molecules being condensed with elimination of water. Santonone does not give the santonin colour reactions with alkalies.

Santoninoxime ($C_{15}H_{19}NO_3H_2O$).

Santoninoxime was first obtained by Cannizzaro and afterwards studied by Gucci. It is prepared by boiling a mixture of 5 parts of santonin, 4 parts hydroxylamine hydrochloride, 50 parts alcohol and 4 parts precipitated calcium carbonate on a water bath for seven hours. The oxime is separated by adding an excess of boiling water to the clear liquor; it crystallises from alcohol in white, lustrous needles—melting point 216-217°C. It is insoluble in cold water and cold alkali, only sparingly soluble in hot water, but readily soluble in hot alkali; the addition of acids precipitates it unchanged from its solutions. When the oxime is heated to 220°C. it decomposes into santonin with the evolution of gas, the hydroxylamine escaping through the agency of the water of crystallisation; it also splits up into its constituents on warming with very dilute hydrochloric acid, the santonin being recovered quantitatively. It is partially resinified by boiling with acetic acid, or dilute sulphuric acid or concentrated hydrochloric acid; in alcoholic solution to which a little water has been added the oxime is completely reduced to a resinous product. The graphic representation of the oxime molecule may be



Two isomeric modifications, the *a* oxime and *b* oxime have been prepared; their formation is attributed to the migration of one hydrogen atom from the methylene radical to the *a* position and a consequent effect on one of the hydrogen atoms of the methyl group in this position.

Tetrahydrosantonin (Santonan).

The ease with which the santonin molecule takes up hydrogen is very remarkable. By hydrogenating, in stages, an alcoholic solution of santonin containing palladium black, Bargellini claims to have found that two atoms of hydrogen are first added, giving dihydrosantonin, which subsequently forms some tetrahydrosantonin and an equivalent amount of santonin, continued passage of the gas forming the tetrahydro derivative. On the other hand, Wienhaus as well as Wedekind consider that the reduction to tetrahydrosantonin proceeds directly without the formation of dihydrosantonin. Recent experiments by Cusmano confirm the findings of the latter chemists. Although the hydrogenation of santonin proceeds at normal temperature and pressure, the reaction is in reality a very complex one; the tetrahydrosantonin obtained as three isomeric forms is less than 40 per cent. of the theoretical quantity, the remainder of the santonin being converted into an oily substance which has not yet been fully examined. From this oily substance Cusmano obtained a crystalline product, probably dihydrosantonin, which melts at 99°C., and gives a green fluorescence in alcoholic potash solution. Tetrahydrosantonin crystallises as thin leaflets, melting point 156-8°C; it is not changed in sunlight; it does not give the characteristic santonin coloration with alkalies or with ferric chloride in concentrated sulphuric acid, boiling with barium hydroxide for several hours produces no change; it is also stable against potassium permanganate for a long time; all attempts to convert it into santonin have been unsuccessful. The chemistry of tetrahydrosantonin derivatives is still in the primitive state.

Santonin is a highly reactive compound; the derivatives here described have been selected on account of their therapeutic and theoretical importance. No mention has been made of numerous isomerides which have been isolated and distinguished by the usual prefixes used in chemical nomenclature. One outstanding feature in the chemistry of santonin is the readiness with which isomerides are formed when the conditions of the reaction are only very slightly altered. In my opinion, many of the investigations of santonin compounds hitherto reported are of doubtful value because the substances examined have not been produced in a chemically pure state; likewise, the study of the products obtained by the destruction of the molecule are not convincing because the results have not been stated quantitatively. It is impossible to overestimate the importance of "purity" and "yields" if we are to make real progress in the chemistry of this interesting drug. The chemical literature of santonin is very abundant, a large section being so controversial as to render the selection of a bibliography extremely difficult. The names most intimately connected with the researches are mentioned in the text. Passing over the earlier reports, which are now of only historical interest, the communications dating from the year 1873 have appeared regularly in:

Atti della Reale Accademia dei Lincei Rendiconti. Rome.

Gazzetta Chemica Italiana. Rome.

Berichite d. d. Chem. Ges. Berlin.

Each volume of the above journals is furnished with an excellent index affording easy access to the contents. In other journals the chief articles of importance are:

Klein—"On Santonin." *Archiv. d. Pharm. Berlin,* 1892, Bd 230, S. 499-513. *Ibid,* 1893, Bd 231, S. 695-704.

Wedekind—"Studies on the Santonin Series." *Ibid,* 1906, Bd 244, S. 623-639.

Wienhaus and v. Oettingen.—"The Hydrogenation of Santonin." *Liebig's Annalen d. Chem.* Leipzig, 1913, Bd 397, S. 219-246.

Wedekind and Berniers—"*Tetrahydrosantonin.*" *Ibid,* S. 246-254.

A complete review of the chemistry of santonin has been published by Francesconi under the title "*Santonina e suoi Derivativi,*" pp. 184, Rome, 1904.

Liverpool B.V.Sc. Examinations.

The following examination list has been issued in connection with the Degree of B.V.Sc. granted by the University of Liverpool (School of Veterinary Science):—

Second Examination, *Parts I. and II.*:—Macdonald, J.

Third Examination, *Part III.*:—Roberts, Ida L.

Final Examination, *Parts I. and II.*:—Morcos, Z.

A conference of representatives of Fife County Council District Committees and Burghs held at Cupar on December 18th, decided to recommend to the different local authorities the appointment of a veterinary inspector at a salary of £600, with expenses, to devote his whole time to the carrying out of the Milk and Dairies (Scotland) Act, 1914, and also to discharge the duties of meat inspector, inspector of dairies, and all the duties that might be completely undertaken by him under the Diseases of Animals Acts.

There are 363 dairies in the county and 5,840 cows. The allowances to the inspector will include a motor car, an office, and one clerk or typist.

A joint committee of eighteen members will control the appointment.

When the report of the sub-committee is approved they will advertise the post, deal with the replies, and make the appointment if the necessary authority is given.

The Veterinary Record.

26th December, 1925.

CHRISTMAS, 1925.

At the close of the fifth year since the birth of the reorganised "National," it is permissible to review with satisfaction the steady and rapid progress which has been achieved by our association. Despite pessimistic warnings and doleful forecasts the "National" has indeed become a power in the land. No longer is the voice of a member in one of our outposts of Empire or indeed in one of the isolated districts of these Islands crying from the wilderness. The hopes felt and expressed by those who, five years ago, shouldered the responsibility of launching this barque of ours have been justified, nay, more than justified.

Unfortunately, it is not possible, even through the medium of our journal, to convey to individual members one iota of the activities of the association upon their behalf and upon that of the profession. It is only in a general sense that such information can be conveyed. Perusal of the business undertaken at meetings of the Council affords some indication of the multifarious nature of the duties of that body, and of the constant endeavour towards professional betterment. Individual members do now realise that however far removed from their fellows they may be, they are not isolated. There is in fact an organisation, of which they are an integral part, which is willing and prepared to employ the whole of its machinery on their behalf, should the necessity arise. If mere numerical strength may be taken as an indication of progress, then there is *prima facie* evidence of a highly satisfactory state of affairs. But proof of far greater value than cold figures is available, namely, the realisation that exclusion from the "National" or from one of its many Divisions is indeed professional ostracism. There is evidence of more enthusiasm and of greater effort throughout the profession than at any period within the memory of the present generation, a *determined* effort to pull together and to stick together for the general well being. With the undoubted evidence of such a spirit within out body corporate, who could or would dare to prophesy adversely.

Our grateful thanks are due to those wise counsellors who, refusing to be swayed by extraneous influences or petty upheavals have withstood the buffeting of minor storms, and with a firm grip upon the helm, have steered the association from troublous seas into calmer waters and ever towards the haven of unity wherein lies strength.

To those who by the generous giving of their time (which often can be ill spared), by their knowledge and experience so ungrudgingly given and so gratefully received, have been responsible for the steady and sustained improvement in our professional journal; to all those who, harassed by their daily duties and with little leisure have yet found time—or made it—to contribute something of interest and of value to their fellows, we express our sincerest thanks.

To those who, having but just arrived within our portal, we extend the hand of fellowship and welcome. You are of us—be with us.

And finally, to those who not having reached the goal of their endeavour are as yet without the gate. Good luck, we shall welcome you.

To all our members greetings.

Civil Veterinary Services in India.

With the administrative reports of the Civil Veterinary Department of the United Provinces and the Bombay Presidency before us, we quite endorse the remarks of the reviewer, which appear in this week's issue. Reports from other Provinces have not yet been received, but sufficient evidence exists to prove that all is not well with the Civil Veterinary Services in India. Complaints of dissatisfaction with their conditions of service reach us from officers concerned, several of whom have either severed their connection with India altogether or intend going on proportionate pension. The paucity of establishment to meet the large volume of duty, the poor outlook which service in India at present would appear to present, the lack of adequate administrative and executive machinery which would result in efficient and meritable service, tend to discourage. It is not for us to criticise, even though we are well aware of the situation. A better course is to offer help by way of suggestion according to experience in veterinary usage, and to support the profession in India in every way possible. We realise that India is at present under reform in Government; all the more reason, therefore, that the interests of the comparatively small veterinary service of that country should not be lost sight of in the many changes of administration which devolution carries in its train. So far as we can gather, and as would appear to be borne out by administrative veterinary reports, there is retrogression in the Civil Veterinary Department—at all events, there is lack of that progress which one expects to see in these progressive days. Without going into any

particulars, we very strongly consider that a Committee of Veterinary Surgeons who have served in India, and who are thereby intimately conversant with the necessary veterinary requirements, both in regard to establishment and for the adoption of proper measures for the prevention and control of disease, should be appointed without delay under the direction of the Minister for Revenue and Agriculture. We are certainly within our right in taking very strong objection to the direction of the Civil Veterinary Services in India being undertaken in any degree whatever by an agricultural adviser. We unhesitatingly say that it is quite wrong, and enough, in itself, not only to discourage the veterinary officer in an efficient rôle, but to arouse hostility, which is not good for India.

We suggest, therefore, to the Government of India that the first desideratum for successful veterinary service should be the re-creation of the Head to the Civil Veterinary Service of the Dependency, irrespective of whether or not veterinary services have been transferred to the Governments of Provinces. We cannot imagine how the co-ordination of services in the Provinces can otherwise be achieved, and initiation of measures for the control of those dire diseases with which India is afflicted must be from one common centre.

Royal College of Veterinary Surgeons.

EXAMINATIONS—DECEMBER, 1925.

LIST OF SUCCESSFUL CANDIDATES.

DUBLIN.

Class A.
McGeady, P. A.

Class B.
Bayson, W. E.
*Peatt, J. N.

Class C.
O'Neill, H. T.
Langley, H. R.
Sexton, M. A.

Class D.
Crawford, R.
Cunningham, E. F.
Huey, W. F. F.
McCleery, E. F.
Molloy, M. A.
Mullaney, P. E.
Mullins, J.
Porter, C. U. K.
Walton, P. F.

GLASGOW.

Class A.
*Walsh, A.
Baird, M.
Kidd, A. A.
Quail, F. A.

Class B.
Hillock, J. M.
*Thomson, A.

Class C.
Budge, J. W.
Clark, E.
Kyle, J. B.
Macdonald, H.
Morris, H. V.
*Robb, A. H.

Class D.
Ford, A. C.
Leask, R. I. S.

* Denotes 2nd Class Honours.

EDINBURGH.

Class A.
Brown, R. H.
Clyne, A. A.
*Davidson, C. B.
Grasovsky, Y. S.
McLaren, G. G.
McLauchlan, J. D.
Mayne, F. J. Y.
Orr, W.

Class B.
Buckner, C. A. P.
Macpherson, D. F.
MacPherson, D. A.
Michie, N. G.
Reid, J.

Class C.
Cameron, J.
Elliot, G. F.
*Fotheringham, W.
*Hamilton, A. P.

Class C (continued).
Hendry, S. P.
Hodson, J. F.
McPhee, D. A.
Naylor, J. C.
Pickering, G. F

Class D.
Boyd, J. M.
Davidson, G. D. W.
Leslie, A.
McDowall, J. J.
Mohey-Dean, M.
Macrae, I. D.
Proud, F.
Rennie, G. G.
Robertson, E. D. S.
Robertson, J. A. R.
*Sharp, S.
Sutton, G. S.
Skinner, T. S.
Weighton, C.
Wilson, H. M.

LIVERPOOL.

Class B.
Cartwright, W. S. W.
*Davies, B. E.
Janel, K. V.
Shedlock, K. W. (Miss).

Class C.
Fraser, A. C.
Higgins, R. L.
Salt, J. G.

LONDON.

Class A.
Andrews, F. N.
Balfour-Jones, S. E. B.
Cartland, B. S. T.
Cautley, P. J.
Messervy, A.
Peele, J. D.
Tansley, W. M. S.
Thomas, D. H.
Tomlin, G. A.
Woods, E.

Class B.
Bhandari, M. S.
Boughey, F. D.
Davies, T.
Ede, P. J.
Goodall, L. M.
*Hale, D. M.
Heathcote, F. C.
Hodgman, S. F. J.
Mills, G. H.
*Thompson, P. G. M.
Turney, J. T.

Class C.
Bruford, J. W.
Handa, B. N.
Smithers, H. E.
Stephens, E. H.
Wood, J. H.
Yarrow, T. B.

Class D.
Barry, W. R.
Baxter, A. J.
Conisbee, E. G.
Datta, S.
Fenn-Smith, G. K.
Ghulati, R. R.
Golledge, C. R.
Griffiths, J. B.
Parry, A.
Quin, K. F.
Rhodes, W.
Richards, H. W.
Thompson, C. B.
Tuckey, R. E. S.
Weighton, A. J.

* Denotes 2nd Class Honours.

REPORTS AND REVIEWS.

Annual Report on the Civil Veterinary Department, United Provinces, India, 1925.

The Annual Report on the Civil Veterinary Department of the United Provinces, India, for the year ending 31st March, 1925, has been received, and the following abstract of establishment and the work the Provincial Veterinary Staff is called on to perform will be of interest. The reviewer also, from his intimate knowledge of India and the urgent need for grading up both Administrative and Executive Civil Veterinary Service of that country, appends a few remarks:

Establishment—

1 Veterinary Adviser to Government U.P.: on leave pending pension.
2 Superintendents: 1 on leave, 7 months; 1 on leave, 8 months.
3 Deputy Superintendents: 1 on command cattle breeding operations, 5½ months; 1 on leave, 2 months.
18 Veterinary Inspectors.
176 Veterinary Assistant Surgeons.

* * * *

48 Districts.
129 Veterinary Hospitals and Dispensaries.
3 Laboratories.
1 Research Station.
1 Stallion Depôt.

* * * *

Mileage covered on Inspection and Supervision—

(*a*) By Superintendents and Deputy Superintendents:—

By rail	33,897	miles.
By road	8,514	miles.
Days on tour	937	

(*b*) By Veterinary Inspectors:—

By rail	26,892	miles.
By road	19,953	miles.
Days on Tour	3,121	
Villages visited ...	4,317	

Executive Work done—

(*a*) Treated in Veterinary Hospitals and Dispensaries (129)—

Animals	181,282
In-patients	7,291
Out-patients ...	173,991
Supplied with Medicine	16,505
Castrations	2,246

(*b*) Treated on Tour:—

For Contagious Disease	42,944
For Non-Contagious ditto	19,683
Castrations	368
Villages visited by Veterinary Assistant Surgeons	12,396

Deaths from Contagious Disease:—

Equines ...	208		
Bovines ...	16,226	Rinderpest ...	7,871
		Foot and Mouth Disease	2,841
		Hæmorrhagic septicæmia ...	3,504
		Anthrax	1,829
Others	1,616	Rabies	193
		Distemper... ...	387
		Fowl Cholera ...	235
	18,050		
Inoculations ...	65,108	Rinderpest ...	44,855
		Hæmorrhagic septicæmia ...	19,692
		Black Quarter ...	561

But for shortage of funds for the purchase of sera from Muktesar, inoculations would have reached approximately 100,000.

As showing the value of sera, 5,776 cases of rinderpest died before inoculation, as against seventy-two after inoculation; 2,158 cases of hæmorrhagic septicæmia before, as against seven after inoculation; and forty-one before as against *nil* in black quarter.

In addition to veterinary inspections and treatment of disease, the Department is concerned in breeding operations. Reports on cattle and sheep breeding are blank; forty-six stallions, chiefly Arabs, were employed during the year, 2,481 mares being covered; twelve donkey stallions were used covering 440 mares. Good progress also seems to have been made in poultry disease research, a demonstration run being maintained.

The recital of the above facts regarding the work done, the mileage covered, and the large amount of contagious animal disease to be contended with, cannot but plainly show to any ordinary casual observer that the establishment provided is totally inadequate to meet such a situation. The wonder is that so small a body of public servants has been able to achieve so much. The total number of animals of the various species in the Province is not given. It is doubtful if there is any machinery existing to supply a correct census, so no percentage sickness can be stated; and, so far as contagious and specific diseases are concerned, it is well known that occurrence escapes report for the reason that there is no proper system to effect it. What is experienced in one Province is found in another. The low plane of veterinary efficiency, which has been allowed to exist too long, cannot be viewed otherwise than as a reflection, not only on a State, but on a profession which, if given a reasonable and proper chance, would go a long way to paying for itself. There is no better field in India for progress than in animal husbandry, and it sounds unfair to a poor community of people that their flocks and herds, through which so many of them get their living, should be in such a constant atmosphere of contagious disease.

Civil Veterinary Department, Bombay Presidency, 1924-25.

The annual administration reports of the Bombay Veterinary Collge, Bombay City and Harbour Veterinary Department and the Civil Veterinary Department in the Bombay Presidency (including Sind) for the year 1924-25, are also to hand.

Bombay Veterinary College.

Generally speaking, the work done, as indicated by the percentage passes at the professional examinations, has been satisfactory. Instruction is for three years and sixty-nine students are on the rolls, *viz.*, twenty-eight in Class A, twenty-two in Class B and nineteen in Class C. Of these, twenty-five are Government scholars, fourteen are stipendaries from native States, local bodies and municipalities, and thirty are paying. Seventeen students graduated at the last examination and, to illustrate employment after graduation, it is stated that out of forty-two graduates during the past three years, twenty-six are in Government employ, thirteen are in Indian State Service, two are in private practice and one is unemployed. The majority of the students are Brahmins; other nationalities comprise other Hindus. Maralhas, Rajputs, Parsees, Mahomedans, Native Christians, Singhalese and Lingayats. Clinical instruction is at the adjoining Sakarbai Dinshaw Petit Hospital, through which, during the year, 581 equines 2,135 bovines and 815 miscellaneous animals have passed.

The College maintains a hostel for students, a students' gymkhana, a riding class, a physical drill class and organises excursions to the Palgar Dairy Farm for Final Year Students.

Bombay City and Harbour Veterinary Department.

The report deals with equine diseases scheduled under the Glanders and Farcy Act within the Town and Island of Bombay, the Bandra Municipality and Bombay Harbour; also with the work performed under the livestock Importation Act. For want of a better system, all equine contagious disease is scheduled under the only Act existing, *viz.*, a Glanders and Farcy Act. The insanitary state of the stables of public conveyance owners and, to a lesser extent, the Arab dealers' stables, has always been a source of anxiety.

Fifty-three cases of glanders, of which thirty-one were clinical cases occurred; twenty-eight of the total belonged to owners of carriages plying for hire. There were six cases of epizootic lymphangitis, three being in the stables of public conveyance owners and two in Arab dealers' stables. There were also four cases of surra.

Altogether, occurrence showed improvement on previous years.

Two thousand eight hundred and sixty horses, one donkey, 342 mules and one zebra were imported. Importations were chiefly from Australian ports (1,404), Persian Gulf Ports (1,176) and English Ports (211). One thousand one hundred and seventy-one animals were tested with mallein and eight reacted. A need for a quarantine station exists, but though the land has been acquired and the plans prepared, no funds are available for building.

Administration Report of the Civil Veterinary Department, Bombay Presidency, for the year 1924-25.

Establishment—

1 Superintendent: on leave, 7 months.
1 Deputy Superintendent and assistant to Superintendent.
5 Veterinary Inspectors.
104 Veterinary Assistant Surgeons.

* * * *

89 Veterinary Hospitals and Dispensaries.

* * * *

Mileage covered on Inspection and Supervision—

By Superintendent and Deputy Superintendent:—

By rail	11,833 miles.
By road	884 miles.
Days on tour	134.

By Veterinary Inspectors and Veterinary Assistant Surgeons:—

377 villages visited by Veterinary Inspectors.
4,551 villages visited by Veterinary Assistant Surgeons.
Many of them were almost continuously on tour.

* * * *

Executive Work done—

(*a*) Treated at Veterinary Hospitals and Dispensaries (89)—

Animals	115,144
In-patients	4,030
Out-patients	111,114
Medicines supplied ...	45,636
Castrations	4,752

(*b*) Treated on tour by Veterinary Assistant Surgeons:—

For Contagious Disease ...	23,034
For Non-Contagious Disease	13,004
Castrations	6,066

Deaths from Contagious Disease—

Equines	...	182	50 glanders (48 in Bombay City).
			120 surra.
			9 epizootic lymphangitis.
Bovines	...	40,873	(109,375 attacked).
			Rinderpest, 39,564 in 1,950 villages.
			Foot and Mouth Disease, 199 in 24,384 cases; (51,412 cases last year).
			Hæmorrhagic septicæmia, 1,584 in 2,350 cases.
			Black Quarter, 233; 2,043 cases last year.
			Anthrax, 1,226.

Others	827	
		Contagious Pleuro-pneumonia in Goats, 324.
		Anthrax in Sheep 230.
		Rabies in Dogs, 69.
	5,882	

Inoculations—

Rinderpest	117,358	
Hæmorrhagic septicæmia	5.357	(serum).
Ditto	1,275	(vaccine).
Anthrax	1,552	
	125,542	

In rinderpest, 15,920 deaths occurred amongst uninoculated cattle, as against 354 in inoculated: in hæmorrhagic septicæmia 879 uninoculated animals died as against nine inoculated, while in anthrax nine inoculated died as against 139 uninoculated. Inoculations are unpopular, as they have to be paid for.

In addition to above work, the Department is charged with breeding operations. The Report is unable to supply any information on these and no Fairs and Shows were held during the year.

In Sind and Rajputana (one superintendent, two veterinary inspectors and seventeen veterinary assistant surgeons) less rinderpest and hæmorrhagic septicæmia have prevailed than in recent years, and the year is stated to have been a good one for cattle. The reporting of contagious disease, however, leaves much to be desired, in many instances intimation of outbreaks only being given when there has been a large number of deaths. It is interesting to note in Sind the existence of liver fluke, parasitic gastritis, contagious pleuro-pneumonia, rabies, variola, ephimeral fever and coccidiosis in cattle; foot-and-mouth disease and contagious pleuro-pneumonia in sheep and goats. The last named disease would appear to have prevailed severely, 3,844 cases and 2,794 deaths being reported.

The remarks made under the heading of the Civil Veterinary Department of the United Provinces, apply with even greater force to the Bombay Presidency. The same tale of appalling contagious disease exists, and there is the same acknowledgement of work left undone. For lack of an adequate establishment, only 50 per cent. of preventive inoculation against rinderpest could be undertaken, and severe prevalence is the natural consequence of no legislative measures dealing with cattle disease. The weakness of veterinary policy in India is very aptly illustrated in the concluding paragraph of the report, which is quoted below: "At the request of the Agricultural Adviser to the Government of India, the following programme of work is included in the Annual Report:

"The energies of the Department will be directed towards the practical application of modern scientific methods of treatment of disease, both curative and prophylactic."

The situation is far beyond the province of an agricultural adviser and pious expressions. It is lamentable that there is no veterinary master mind under the Government of India who could initiate and direct veterinary policy, whose business it could be to co-ordinate this in Provinces, who could suggest and frame legislative measures in respect to disease, grade up instruction, and ensure that veterinary services throughout the country are placed in a much more satisfactory and economic level than they are at present. To handle devastating bovine and ovine diseases without reasonable legislative machinery, is impossible. A properly constituted Diseases of Animals Act, with inset Orders for the various contagious diseases, could be made simple in its application and without offence to native sentiment, and its benefits to India, to its Provinces and Native States would soon be realised and have far-reaching effects. Decentralisation of services into Provinces is right enough in part, but there ever must be matters of general policy and administrative guidance which no one but an administrative Head of service can direct or supply. The Government of India would be well advised to consider this matter without further delay. It is understood, moreover, that four years ago, at the request of the Honourable Member for Revenue and Agriculture under the Government of India, a simple Diseases of Animals Act was submitted to Provinces for opinion and approval: it is surprising, therefore, to learn that after this lapse of time and continued severe prevalence of all diseases, it is not in operation in any shape or form. J. M.

Canine Distemper: a Practical Handbook, by Louis Sewell, M.R.C.V.S.

This book is intended as an aid to the dog breeder and dog lover in diagnosing and treating cases of distemper and must not, therefore, be looked upon as an addition to the scientific liteature on that subject. It is as well that this is clearly stated, because we cannot accuse the author of deviating from his original purpose.

It is, of course, well known how variable a disease is distemper, but, after reading the book through, we are rather led to ask ourselves if the lay reader has been really aided or merely confused in his effort to gain further information on the subject.

Nearly every statement made has at least one or two qualifications attached to it—and in some cases flat contradictions. Some of the phraseology used is not that which one would expect from a scientific pen, even if catering for the kennel-man. The book is interleaved with excellent portraits of various breeds of dogs for the purpose, we presume, of making it more interesting, as they have no connection with the subject matter. The chapters on nursing contain many valuable hints to the uninitiated and the concluding chapter should help to kill many of the popular fallacies that are so prevalent regarding distemper. The publishers are Messrs. George Routledge and Sons, Ltd., of Broadway House, 68-74 Carter Lane, E.C.4. The book is clearly printed and suitably bound, and the published price is 4s. 6d.

Animal Breeding Research Department, Edinburgh.

ABSTRACTS FROM DR. F. A. E. CREW'S REPORT.

The following passages are taken from the Fifth Annual Report of the Animal Breeding Research Department, the University, Edinburgh, which formed the subject of an editorial article appearing in last week's *Record*.

PUBLICATIONS DURING THE YEAR AND WORK IN PROGRESS.

F. A. E. CREW. (1) *Papers published*:

(1) *Hermaphroditism in the Pig.* (*Jour. Obstet. and Gynaecol.*, 1924). Hermaphroditism is common in the pig, and investigation has shown that the tendency to produce such abnormal individuals is hereditary. In order to explain the gradations of the condition that are encountered it is suggested that the ambivalent left gonad undergoes differentiation before the posterior, the process passing as a wave from pole to pole. Further it is suggested that these abnormal individuals are genetic males in which the relation between the male and female sex-determining factors is such that during the earlier part of differentiation the female-determining reactions are in excess, but that later these are overtaken and replaced by the male sex-differentiating reactions. The degree of abnormality is determined by the point during the phase of sexual differentiation at which one type of sex-differentiating reactions is replaced by the other. Now that adequate accommodation has become available, it is hoped to carry out critical breeding work on this subject.

(2) *The Bulldog Calf. A Contribution to the Study of Achondroplasia.* (*Proc. Roy. Soc. Med.*, 1924). In certain breeds of cattle (and also of sheep), a certain proportion of the offspring are dead-born and deformed. The abnormalities are very similar to, if not identical with, those constituting the condition of achondroplasia in the human. Investigation has shown that the condition is hereditary; that its mode of inheritance is fairly simple; and that the cause is a retardation in the time at which the pituitary comes into action during fœtal life. The study is being continued. Its real interest to the breeder is that it shows perfectly clearly that any characterisation, normal or abnormal, that is transmitted in inheritance in accordance with Mendelian scheme is a character in the Mendelian sense and can only be fixed in, or eradicated from, a stock by the employment of Mendelian methods of breeding.

(3) *The Sex Ratio and the Question of its Control.* (*Intern. Rev. Agric. N.S.*, 1924). It is established that in the mammal the male is digametic, elaborating two forms of sperms, one which when fertilising an egg will yield a male the other a female; and that in the bird it is the female that is digametic. This paper is a review of what is known concerning the agencies that effect the differential production and selective elimination of one of the forms of gametes elaborated by the digametic sex. It also discusses the fact that it is the digametic sex among offspring that is eliminated before or shortly after birth under conditions that are unfavourable. The purpose of the paper was to bring up-to-date our knowledge of the sex-determining mechanism since any effort to control this mechanism demands a full knowledge of what this mechanism is. It is known that many agencies, X-rays, for example, affect the differential production of the two sorts of gametes and investigations dealing with this subject are now in progress.

J. E. NICHOLS. (1) *Papers published*:

(1) *Fertility in Sheep.* (*Jour. Minist. Agric.*, 1924). Data from 133 flocks for the season 1923-24 were collected for the purpose of investigating breed differences in fertility and obtaining information on the occurrence of barrenness and abortion in pure-bred flocks. The breeds from which data were obtained were Border Leicester, Leicester, Dorset Horn, Suffolk, Oxford Down, Lincoln, Southdown, Hampshire Down, Blackface, Kent or Romney Marsh, Cheviot and Shropshire. Although the returns were fewer in number than it was hoped, the records of 19,373 ewes were available for consideration, and the conclusions drawn from an analysis of the data were fairly representative of the breeds considered. The records were, however, insufficient to warrant classification according to district altitude and type of land.

The pure-bred flocks showed a total lambing percentage of 124.6 lambs per 100 ewes, the percentage of ewes bearing twins being 30.8 and of those bearing triplets 1.8; the total percentage of barren ewes was 3.4. It was found that fertility is influenced by those factors, hereditary and otherwise, that affect primarily the tendency to produce a high proportion of multiple births and a low proportion of barrenness, while there is apparently a correlation between barrenness and a low percentage of twins. Incidental records of 1,398 ewes crossed with rams of other breeds were available; these showed a lambing percentage of 136.6 and a percentage barrenness of 3.5. It was also possible to *obtain figures showing the effect of 'flushing'* the ewes before service, that is, of producing a high state of nutritive activity and an improved condition by means of additional feeding. The 1,775 ewes which had been flushed showed a lambing percentage of 149.5, and the conclusion that the practice of flushing has a beneficial effect on the yield of the lambs was supported by records of a single flock over a number of years, the yield of lambs during the flushed seasons being 129.9 per cent., and when not flushed 116.2 per cent.

It was also found that barrenness and abortion (apart from pathological causes) are largely due to environmental factors, but the importance of hereditary factors cannot be neglected. Data on the sex ratio of lambs gave this to be about 97 males per 100 females.

(2) *Work in Progress*:

(2) *Fertility and Fecundity in Sheep.* In order to obtain evidence on the effect of environmental influences from season to season, the questionnaire distributed last year was again sent to those breeders who had made accurate returns, and if the data obtained for 1924-25 show significant differences, the investigation will be continued further. Meanwhile it has been possible to obtain data extending over the period 1911-24 for flocks of two breeds, Cheviot and Blackface, kept under identical conditions (hill) for the whole period of fourteen years. By comparing these data with the metereological records for the same time

most suggestive associations between climatic conditions and fertility have been demonstrated, and also indications of differential response of the different breeds to climate. Thus it was found that the mean temperature at tupping time has a greater influence on the total yield of lambs than the mean temperature at lambing time; and that the latter has a greater influence in the case of the Cheviot than in the Blackface. Grouping together barren ewes, ewes which aborted, and those which after lambing were unable to nurse their lambs, it was found that the influence of mean temperature on the proportion of this group to the number of ewes put to the ram is greater in the Blackface than in the Cheviot, while there is a suggestion that the mean daily range of temperature at tupping time has an inverse effect on the total yield of lambs for both breeds. *The data suggested that the number of rainy days and the rainfall in inches at lambing time are associated inversely with yield.* It was also possible to draw the tentative conclusions (a) that climatic factors have no effect on the sex-ratio as observed at castrating time; (b) that, apart from consideration of the climatic factors, in the flocks examined there is no relation between sex-ratio and yield of lambs per hundred ewes; and (c) that while there is no apparent association of infant mortality between the end of the lambing season and castrating time with the ultimate sex-ratio, this does not exclude the possibility of a selective mortality of the sexes.

T. MARCHLEWSKI. (2) *Work in Progress:*

(6) *Craniological Studies on Dogs.* The study of phylogeny of domesticated animals, their relationship to the corresponding wild forms, has a direct bearing upon the problem of the origin of species. While the paleontologist deals with extinct and fossil forms that can be merely described and perhaps furnish ground for more or less justified speculation, it is possible to use as material living organisms some of which demonstrate astonishing resemblance to forms regarded as extinct, and show only slight variation under the influence of the agencies brought about by domestication. The possibility of introducing experimental genetical methods where systematic description has said its last word, offers one an opportunity of not merely describing but of explaining the process of evolution. For the study of variation and the relationship between the wild and the corresponding domesticated forms, it is necessary to have an exact knowledge of the skeletal and cranial features of the various domesticated breeds. Further, an accurate study of the range of variation of cranial features within a given pure breed is essential as a basis for standardising in cross-breeding experiments.

The dog was selected as experimental material on account of the great diversity of forms in this species. The following results were obtained from craniological studies. The form and rate of development of the skull is not entirely determined by the size of the animal; apart from certafn conditions which appear to stand in a physiological relation with size of the animal, there exist other features which determine the breed type, and which are genetic in nature. Further, it was observed that in related breeds the skulls, though exhibiting a similar mode of development, differ slightly in corresponding regions and this variation, though somewhat overlapping, is nevertheless typical for the respective groups. Finally, as no apparent correlation was observed between brachycephaly and an achondroplasia-like condition in the dog, a bulldog bitch was mated to a dachshund in order to put the matter to an experimental test.

Y. TAMURA. (2) *Work in Progress:*

(7) *Sex-Dimorphism of the Suprarenal Gland.* According to Masui and Tamura, the size of the suprarenal gland differs markedly in the two sexes, it being considerably larger in the female than in the male. This difference is due to the degree of development of the *zona reticularis*. In very young individuals the *zona reticularis* develops in both sexes; in the female it increases gradually, while in the male it disappears prior to sexual maturity, only a few degenerate cells being left. In old females it disappears almost entirely, assuming the same structure as that of the male. In castrated males the suprarenal is larger than in the normal. This enlargement is due not to an increase in the bulk of the component tissues but to the appearance of a *zona reticularis*, while the medulla becomes slightly diminished. The growth of the *zona reticularis* is so striking that it becomes almost similar to that in the suprarenal of a normal female. As a result of ovariotomy in the female no structural changes occur, the *zona reticularis* remaining normal. According to these facts it can be assumed that there exists a sex-dimorphism of the suprarenal. Experiments were carried out in order to determine what causes the disappearance of the *zona reticularis* in the male prior to sexual maturity and its reappearance after castration.

Individuals of both sexes were gonadectomised (castrated or spayed, at three weeks; at eight weeks they received implants of the gonad (sex-gland) of the opposite sex taken from individuals of the same litter. As was expected, the results of this experiment were negative; this is in agreement with the results of Moore and several other investigators. Testicular grafts disappeared after 4-5 weeks; ovarian grafts, though remaining, degenerated, so that no influence was effected on the suprarenal. In the second series of experiments the isolation of the testis was effected by means of removal of the deferent duct; of the epididymis and deferent duct; or ligation of the deferent duct. It was thought that the isolation of the testis would have some bearing on the transplantation of the testis in the male. The experiments are not yet completed, but it can be stated that, as the result of the removal of the epididymis and deferent duct, there occur structural changes in the suprarenal which are somewhat similar to those following castration, though the structure of the suprarenal in these cases is not identical with that of castrated males. It is thought that injection of testicular extract into gonadectomised and immature males will help in the elucidation of the problem.

Sex-dimorphism of the Suprarenal. Experiments are now in progress which have for their object the problem as to whether there exists in the fowl sex-dimorphism of the suprarenal, as is the case in mammals (mouse).

Sterility. A dingo bitch was received from Mr. T. H. Gillespie, the Director of the Scottish Zoological Park. It was stated that she was sterile on account of the high degree of inbreeding. The external reproductive organs were of the normal female type, and four pairs of normal teats were present. On *post-mortem* examination, small

irregularly shaped ovaries were found, one on each side; the follicles were visible with the naked eye. The uterus and vagina were infantile, the fallopian tube adherent, so that there was no connection between ovary and uterus. The thyroid was found to be enormously enlarged and lighter in colour than normal. On histological examination the gonads were found to have retained the structure typical of an ovary, although the peripheral region was composed of rather a deep layer of fibrous tissue in which a few atretic and cystic follicles were present. The structure below this contained many small and a few large follicles; most of them were in various stages of atresia. In examining sections of the thyroid, only three small, comparatively normal, vesicles were found, the remaining being all in more or less advanced stages of degeneration. The *suprarenals* were also shrunken; the *zona glomerulosa* invaded in some parts the *zona faciculata* which was normal. In the *zona reticularis* the cytoplasm had vacuolated, and in some parts this zona was almost absent. The medulla had diminished. In the *pituitary* here and there white patches with a black speck were visible; under high magnification these were seen to be composed of thin threads of connective tissue and a degenerate nucleus.

It is seen from the above description that every endocrine organ, including the ovary, had degenerated, whilst the external genitalia were normal. Since this was the only case examined, it is impossible to determine whether or not these facts are caused by inbreeding. In order to find an answer to this question, it is necessary to examine sterile individuals, both from inbred and ordinary stock.

Foot-and-Mouth Disease.

The Lords and the Slaughter Policy.

In the House of Lords recently, the Marquess of Lincolnshire called attention to the ravages of foot-and-mouth disease and the consequent loss and inconvenience to the districts affected, and asked whether the Government proposed to modify the policy hitherto adopted to deal with the disease. Between 1902 and 1925, he said, 333,000 animals had been killed, at a cost of £5,000,000, and since September 25th of the present year 1,700 animals had been slaughtered, and the estimated compensation was £223,000. Did the Government consider that the country in the present circumstances could afford this great expense, and did they really think that their policy had been justified by the results? Could the country afford to go on with this Herodian policy of kill, kill, kill, at a time when the Budget was £800,000,000 a year?

The Earl of Denbigh asked whether farmers generally were supporting the Ministry of Agriculture in their policy, and whether they had any reason to suspect that the policy of paying compensation was being exploited by certain dealers.

Lord Bledisloe, Parliamentary Secretary, Ministry of Agriculture, said all the more intelligent farmers were giving the Ministry of Agriculture all the support they could desire, or, indeed, deserved, in their policy with regard to foot-and-mouth disease. There were circumstances during the more serious epidemic of two or three years ago which evoked suspicion that there were irregularities on the part of certain dealers. The Ministry had tightened up their regulations and, incidentally, reduced the amount of compensation for infected animals, and they hoped there would be no further grounds for any such suspicions in future. Lord Lincolnshire had asked him two specific questions. The first was whether the country could afford the great expense involved in the policy of slaughter. The answer was that the country certainly could not afford the alternative to the present policy. The second question was: Had the slaughter policy been justified by results? The answer was that the policy had been justified up to the hilt. During this year there had been 247 outbreaks in England. Speaking roughly, 19,000 head of stock—cattle, sheep, pigs, and goats—had been slaughtered, and the compensation paid was £257,697. The Ministry had reason to believe that the disease was now well under their control, and that largely as a result of the partial standstill order, which, in their opinion, had proved an entire success. During the last six weeks there had been a progressive decline in the number of outbreaks, the numbers being 34, 22, 19, 20, 15, 10. Since September 25, 222 outbreaks had occurred in this country. In France, in September, 2,351 outbreaks occurred, and in October, 3,200; in Holland, 7,823 and 4,300 in those two months respectively; and in Denmark, 3,600 outbreaks in September. The outbreaks last year numbered 1,440, in 1923, 1,929, and 1922, 1,140, so that, as compared with those three years, this year's epidemic had not been relatively very serious. In Germany, in 1924, the outbreaks were 14,372; in Belgium, 18,181; in France, 12,372; and in Holland, 66,859. The United States had copied us in the policy of slaughter, and had continuously applied that policy since 1902. It was from the time of the adoption of the policy of slaughter that the abatement of the disease took place in this country. He quite agreed that it was not a serious disease, and that there were plenty of cures, but they preferred rather to insist upon the policy of slaughter than attempt to apply remedies because the disease was the most infectious known. No more than 8 per cent. of the animals affected would die from it in the event of their not being slaughtered. The alternative to the present policy would be isolation, but it did not follow that isolation would be in any way successful in this country. The actual percentage of stock in this country which had had to be slaughtered, even during the worst epidemics, was relatively very small. In the very serious epidemic of 1922-24 no more than 1.5 per cent. of the whole cattle of the country was slaughtered.—*The Times.*

* * * *

Ministry's Reply to Complaints.

"Complaint has been made in letters to *The Times* of the manner in which the Ministry of Agriculture's policy of slaughter of animals in areas infected with foot-and-mouth disease has been carried out in certain cases in Wiltshire.

"The letters relate particularly to a case which occurred recently near Chippenham. It is stated that cattle were slaughtered about 20 yards from the Chippenham-Swindon main road, immediately in front of the field gate, and also in front of a private house. Both the slaughter of the beasts and the burning of the carcasses were visible to all who passed, including children. Motorists pulled up to see what was happening, and the congestion of traffic, in the dense cloud of smoke from the burning carcasses, resulted, it is said, in several minor accidents on the road. In addition, the occupants of the neighbouring house were subjected to the offensive smoke and smell for many hours. It is added that the revolting operation could have been carried out behind a shed which was in the field, where it would at least have been invisible from the main road.

"A message from our correspondent at Trowbridge also states that there have been many complaints of the slaughter and cremation being carried out too near the highway and to dwelling houses. At a recent meeting of the Bradford-on-Avon Rural District Council, Mr. T. P. Beaven, a local magistrate, called attention to a case at Holt, and said that, though the field in which the affected cattle were grazing was a considerable distance from the nearest houses, yet the cattle were slaughtered and cremated within 40 yards of dwelling houses, and people living in the houses were able to see the actual slaughtering from their windows and had to endure for more than 24 hours the fumes of burning oil and flesh, which caused them to be ill.

"It is pointed out that as soon as an outbreak of foot-and-mouth disease is confirmed the arrangements for slaughter and cremation are taken out of the hands of any local authority, and carried out entirely under the direction and supervision of the Ministry of Agriculture's officials. Neither the County Diseases of Animals Committee nor the County Police have any jurisdiction in these matters.

"The complaints were brought to the notice of the appropriate department of the Ministry of Agriculture, on whose behalf an official stated that no observations could be expected from the Ministry on individual cases unless an official inquiry had been made. In general, the policy of the Ministry was to have condemned animals destroyed, and their carcasses burnt,with as little movement as possible, both before and after their death. That was an obvious precaution in dealing with an extraordinarily contagious disease. Another precaution, which they were taking, was to reduce to the minimum the distances over which they carried the large quantities of fuel required for the fires to burn the carcasses, since infection could be carried on, and spread by, the wheels of the vehicles used in such transport. These considerations must occasionally, especially where infected premises were near main roads, result in more or less public spectacles such as those described. The Ministry were satisfied that their inspectors were making right use of their powers, and that where annoyance was caused to the public it would be found to be unavoidable, having regard to the many considerations involved in the intensive effort which was being made to stamp out the present epidemic." —*The Times.*

* * * *

The *London Gazette* on Tuesday of last week announced that the Minister of Agriculture had ordered the following additional rule for foot-and-mouth disease infected places:

"No live poultry, hare, or rabbit, or the carcass of any head of poultry, hare, or rabbit, shall be removed from an infected place, except with the permission in writing from an inspector or officer of the Ministry or an inspector of the local authority, and then only in accordance with such conditions as may be stipulated in the permission authorising such movement. For the purposes of this rule poultry includes domestic fowls, turkey, geese, ducks, guinea-fowls, and pigeons."

"The Order," says *The Times* of December 16th, "comes into operation immediately. In reply to inquiries at the Ministry of Agriculture yesterday as to how far it was likely to affect Christmas food supplies, an official pointed out that the Order would apply only to actually infected premises, and not to whole infected areas within which the movement of animals was restricted. The total number of outbreaks throughout the whole country during the present epidemic had been 222; but the number of premises actually infected at present was a good deal lower, since many of the premises infected in the early stages of the epidemic were now free again. Thus the new order should cause no widespread, and certainly no serious, interference with supplies of turkey and geese for Christmas dinner. It was added that the Ministry's officers might in their discretion permit the removal of the carcasses of poultry from foot-and-mouth disease infected premises, provided that they were stripped of feathers, and drawn, before removal."

DIVISIONAL REPORT.

Central Division.

Interesting Exhibits.

A departure from custom on the part of the President, Sir John Moore, in replacing the stereotyped pattern of Address from the Chair at the commencement of the session by a paper entitled "Foot-and-Mouth Disease as seen in Austria," provided an interesting and much-appreciated feature at a meeting of this Division which was held at 10 Red Lion Square, on Thursday, December 3rd, 1925.

The gathering was rendered additionally noteworthy by the presentation of a most instructive report of the proceedings at the veterinary inspectors' section of Royal Sanitary Institute Congress held in Edinburgh last July, by Lieut.-Colonel T. D. Young, who represented the Division thereat. Both the above contributions to the proceedings receive prominence elsewhere in this issue of the *Record*.

The attendance book was signed by the following: Sir John Moore (President), Messrs. W. C. Auld, W. Brown, C. Davenport, Major G. W. Dunkin, Mr. F. J. Eardley, Major F. T. G. Hobday, Mr. Herbert King, Mr. Hamilton Kirk, Messrs. J. H. Mason, J. W. McIntosh, T. H. Michie, H. J. Parkin, W. Perryman, J. W. Pritchard, J. Stephens, Lieut.-Colonel J. W. Rainey, Major G. Rees-Mogg, Messrs. D. T. Reid, Juan E. Richelet, Capt. Ross-Grant, Messrs. E. L. Stroud, W. N. Thompson, W. Townson, A. C. Wild, J. Willett, Mr. E. C. Winter, Professor G. H. Wooldridge, and Lieut.-Colonel T. Dunlop Young, together with Mr. J. F. Macdonald, Hon. Secretary.

Visitors: Dr. Max H. Berg, Messrs. C. Cairns and John K. Shaw.

The *Minutes* of the May, June, and July meetings of the Division, and of the annual dinner, having been published in the *Record*, were taken as read, and were confirmed and signed as correct.

Correspondence.

(1) *Apologies* for absence were announced from Major P. J. Simpson and Mr. F. Willett.

(2) From Messrs. Harrison, Barber and Co. in reference to the exhibit of the horse's bladder shown at the previous meeting of the Division. Mr. King had undertaken to find out what he could of the history of the case and, at his request, the firm had written that the animal did not appear to have had any special history. The owner noticed nothing exceptional about it, beyond the fact that it was inclined to colic. The horse was destroyed, on account of age, after fourteen years' good service.

(3) From Captain H. B. Collet, of Aylesbury, requesting that his resignation from the Division be accepted as he was working single-handed in a country practice ,and found it a matter of impossibility to attend the meetings.

(4) From the President of the N.V.M.A., inviting the Division to subscribe, at a cost of £2, a link of the presidential chain of office.

(5) From Mr. Bullock, honorary secretary of the Frank Garnett Memorial Fund, as follows:—

FRANK GARNETT MEMORIAL FUND.

Dear Sir,—I have been directed by the Executive Committee of the above Fund to draw your attention to the method adopted by the Lancashire V.M.A., and the Western Counties V.M.A. to make known the Fund and to secure further subscriptions. These Societies have kindly undertaken to act, as it were, as a local Committee of the Fund. They have communicated with each individual member and made a special appeal for subscriptions which have been transmitted by the Secretaries to this office. In this way subscriptions to the amount of over £22 have been received in addition to the subscriptions already sent direct in response to the first appeal.

The Executive Committee would be glad if you would bring the matter of the Fund again before your Council, in order that they may consider the advisability of taking similar steps to secure the support of members of your Society.

It has not yet been decided what form the Garnett Memorial will take. As the total amount subscribed to date is less than £400, which will produce an annual income of from £16 to £20, it will be seen that the selection of a suitable form of Memorial with such restricted funds will be a matter of some little difficulty. The work of Frank Garnett for the advancement of the best interests of the profession is worthy of the best memorial the profession can raise. I trust therefore to hear that your Society will be willing not only to contribute to the Memorial out of its own funds, but will also undertake the additional task of endeavouring to secure further contributions from those members who have not already subscribed direct.

The Executive Committee have decided to keep the Fund open till 31st March, 1926, after which date a meeting of the General Committee will be called for the purpose of considering what will be the most suitable form for the Memorial to take. As your Society is represented on the General Committee any suggestions which your members may wish to put forward can be submitted at that meeting and will receive careful consideration.—Yours very truly,

FRED BULLOCK, *Honorary Secretary.*

J. F. Macdonald, Esq., M.R.C.V.S.,
185 Upper Richmond Road,
Putney, S.W.
November 10th, 1925.

(6) From Messrs. H. Gray, W. Willis, T. Wolsey, T. C. Garry, J. W. Buxton, W. W. Reekie, and W. Perryman, accepting and thanking the Division for the honour of life fellowship recently conferred upon them.

The Hon. Secretary explained that the other recipients of the honour were present at the meeting at which it was given and returned thanks at the time.

(7) From Mr. Juan E. Richelet, accepting and expressing his heartfelt appreciation of his election as Honorary Fellow of the Division.

The PRESIDENT: I should like, at this juncture, to introduce Dr. Berg to you. (Applause.) He is at present, and has been for some time, resident in London, and is a member of the Royal Society of Medicine. Dr. Berg is very interested in veterinary science as well as medical science, and he thought he would like to come both to make our acquaintance to-night, and to listen to my remarks on the subject of foot-and-mouth disease in Austria. (Applause.)

Dr. BERG having made suitable acknowledgment of his welcome:

The PRESIDENT proceeded: Arising out of the correspondence, I am particularly sorry that Capt. Collet has handed in his resignation. (Hear, hear.) He is an old friend of mine and an officer who served under me in France. I feel that I should write to him personally, expressing the regret with which we receive his resignation, and asking him to reconsider his decision. (Applause.)

With regard to the chain, I had a good look at it the other night when it was being worn by the President of the "National," and I take it that every Society is asked to pay for a link, which will come to about £2. Another thing I thought about the links was that the Presidents of the Divisions ought to have their names on the link subscribed for by their Divisions. There is room on the back for that to be done. I spoke to Professor Buxton about it. The main point at present, however, is the subscription of £2.

Mr. J. WILLETT proposed and Colonel T. D. YOUNG seconded, that the subscription be made.

Professor WOOLDRIDGE: On a point of order, sir, may I draw your attention to the fact that all financial matters of that sort are in the hands of the Council.

Mr. J. WILLETT: I stand corrected. I propose that this matter be remitted to the Council with the recommendation that the Society contributes the sum of £2.

Lieut.-Col. YOUNG seconded the proposition, which was carried unanimously.

(*To be continued.*)

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

January 6th—N.V.M.A. Committee Meetings 10 a.m.—12-30 p.m.
Council Meeting 2-30 p.m.
" 6th—R.C.V.S. Committee Meetings 4-30.
" 7th—R.C.V.S. Committee Meetings 10-30 a.m.—5 p.m.
" 8th—R.C.V.S. Committee Meetings 10-30 a.m.—1 p.m.
Council Meeting 2 p.m.
" 11th—R.C.V.S. Issue of Overseas Voting papers for annual election of Council.
" 14th—Meeting of the Central Division, 10 Red Lion Square, W.C.
" 21st—R.C.V.S. Special Meeting of Council.
March 31st—Garnett Memorial Fund—Closing Days.
April 1st—R.C.V.S. Annual Fee of £1 1s. 0d. due.
" 8th—R.C.V.S. Committee Meeting.
" 9th—R.C.V.S. Committee Meeting; Council Meeting 2 p.m.; Garnett Memorial Fund Committee Meeting.

ROYAL SANITARY INSTITUTE: JUBILEE AND LONDON CONGRESS.

The Royal Sanitary Institute, which has been working for fifty years in the cause of Public Health, will celebrate

its Jubilee by holding an Imperial Congress in London next year from July 5th to 10th. THE RIGHT HON. NEVILLE CHAMBERLAIN, M.P., Minister of Health, has accepted the Presidentship of the Congress.

The Congresses held by the Institute during the past fifty years have given opportunities for representatives and officers of Sanitary Authorities to meet and discuss the many problems that arise in the Public Health administration of the country, and have also dealt with subjects of a Colonial and International interest. These meetings are of great value in stimulating Public Health work, and are much appreciated by all officers engaged in Public Health administration.

The Lord Mayor and Corporation of the City of London are co-operating in the Congress by granting the use of the Guildhall for the opening meeting.

The work of the Congress will be divided into six Sections and seven Conferences.

THE RIGHT HON. THE LORD MAYOR OF LONDON (Sir William Pryke) will preside over Conference I., Representatives of Sanitary Authorities.

SIR GEORGE NEWMAN, K.C.B., M.D., F.R.S.E., Chief Medical Officer, Ministry of Health, over Section A., Sanitary Science and Preventive Medicine.

SIR CHARLES RUTHEN, O.B.E., F.R.I.B.A., Director-General of Housing, Ministry of Health, over Section B., Engineering and Architecture.

SIR WILLIAM HARDY, F.R.S., Director, Food Investigation Board, Department of Scientific and Industrial Research, over Section E., Hygiene of Food.

ALDERMAN SIR CHARLES WAKEFIELD, Bart., C.B.E., over Section F., Hygiene in Industry.

SIR WILLIAM J. COLLINS, K.C.V.O., M.D., F.R.C.S., over Conference VI., Sanitary Inspectors.

ALDERMAN W. PHENE NEAL over Conference V., Veterinary Inspectors.

G. W. HUMPHREYS, C.B.E., M.Inst., C.E., Chief Engineer to the London County Council, over Conference IV., Engineers and Surveyors.

DR. G. F. BUCHAN, Medical Officer of Health, Willesden, over Conference III., Medical Officers of Health.

Official representatives have already been appointed to attend from INDIA—Bengal, Punjab, Mysore; AUSTRALIA—Sydney; NEW ZEALAND—Auckland and Christchurch; STRAITS SETTLEMENTS—George Town, Penang and Singapore; and from the Spanish Government,

. . . . . .

Mr. W. R. Townson, M.R.C.V.S., of Peterborough, has been awarded the Royal Sanitary Institute's Meat Inspector's Certificate.

PRESENTATION TO PROFESSOR GEMMELL.

On Thursday, December 10th last, representatives of the staff and students of the Royal (Dick) Veterinary College, Edinburgh, waited upon Professor G. H. Gemmell, F.I.C., at his residence, for the purpose of presenting him with an electric standard table lamp and two framed metal plaques, on the occasion of his retirement from the chair of chemistry and Physics of the Royal (Dick) Veterinary College.

Dr. R. Stewart MacDougall, representing the staff, referred to the eighteen years' valuable service rendered by Professor Gemmell to the College, remarked how fortunate the college had been in numbering among its staff a man of his knowledge and ability, and said that the lamp and mural plaques, beautiful as they were, were but a meagre token of their regard for the professor.

On behalf of the students, Mr. E. J. Heather, President of the Students Representative Council, spoke in high terms of the friendship which existed between Professor Gemmell and the students and expressed the hope that he would retain his connection with the social life of the college.

In reply, Professor Gemmell thanked the deputation for the handsome present and said that it was with great regret that he was forced by medical advice to relinquish his charge. He recalled the many friendships he had made during his long association with the college and his part in the social life of that institution.

The deputation was subsequently entertained to tea by Mrs. and Miss Gemmell.

THE TSETSE-FLY PROBLEM.

The solution of the tsetse-fly problem is one of supreme importance to tropical Africa, not only on account of the losses in stock due to nagana and other trypanosome diseases, but because of sleeping sickness in man. Many schemes for the eradication of this insect have been suggested—trapping, cutting down undergrowth, and so on. A method which has been popular with many people is the suppression of the wild game hosts and the consequent starvation of the fly. The Society for the Preservation of the Fauna of the Empire is among the individuals and bodies which have protested against this policy, and has recently issued a pamphlet urging that, should extermination of game be necessary, it must be discriminate; and pointing out that epizoötics of rinderpest have killed out game in parts without also destroying the fly. It is suggested also that from wild game it may be possible to obtain an immune serum for use in stock. The object of the society, however, is mainly to preserve the big game, and much capital is made of the monetary value of these animals to the African colonies. While we cannot agree that the value of game to the sportsman should have any influence on the fight against trypanosome diseases, yet we agree that it would not be advisable to exterminate game without fuller investigations, such as those Mr. Swynnerton is carrying out. Cattle definitely carry the human parasite, and in them it causes a chronic condition. The situation has not been fully explored yet; but in any event history shows that to tamper with the balance of nature is at best a hazardous task, and (as Australian rabbits and American sparrows have shown) may be followed by unexpected consequences.—*British Medical Journal.*

A bill passed by the Pennsylvania State Senate, requiring that milk be sold only in original containers, should certainly stimulate the live stock market.—*Detroit News.*

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Humanitarian Societies and the Veterinary Profession.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Every educated reasonable person who considers the matter at all must agree with Mr. Henry Gray, in condemning the so-called treatment of sick and injured animals by persons without scientific knowledge and training at charitable institutions controlled by "quacks." At the same time, if the necessity for some sort of free clinic for animals is admitted, it is difficult to maintain the proposition that all necessitous cases in London should

be taken to Camden Town or Wandsworth. I assume that the canine population of London generally has at least kept pace with the increase in the human population of recent years and that the need, if it exists, for a free clinic is as great in the hinterland of Stratford and Canning Town as it is in the more accessible regions of Holloway and Kensington.

The principle of free, or nearly free, clinics at fairly convenient centres in cities for the medical and surgical treatment of human beings is firmly established and is, of course, carried out at most of the London hospitals, as well as at other places in the Metropolitan area. This established principle is, I suppose, a precedent which, in accordance with an ever-growing humanitarian sentiment, must be followed sooner or later by free clinics for animals, notwithstanding the damage this inevitably causes to the private practices of many of us. I myself, am at considerable loss from the activities of the " Dispensary for the sick animals of the Poor " in the Commercial Road.

It would be absurd, however, to allow financial interests or professional pride so to overcome the judgment as to induce one to assert that this and similar institutions in impoverished congested districts do no good. But it would be equally absurd to suppose that scientifically untrained personnel entrusted with power of life and death do no harm. Their replacement by properly-qualified and trained veterinary practitioners would retain the element of good and eliminate the great amount of entirely unnecessary suffering that inevitably results from " quackery."

It seems to me, therefore, that able advocates like Mr. Henry Gray and others, instead of opposing the principle of free clinics (for the animals of poor persons), which are an accomplished fact, should devote their energies to the perfectly feasible and laudable object of securing that these clinics are controlled and staffed by whole-time veterinary practitioners. The cost of institutions so staffed would be substantial enough to ensure that the community would not be in danger of being overwhelmed, as it is at present, by a redundancy of misdirected charity. There would thus be provided a three-fold protection—namely : for the animals, for the public, and for the private practitioner.—Yours faithfully, J. W. RAINEY, 20 High Street, Bow, London, E. 3.

December 19th, 1925.

The Royal Veterinary College.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—If anybody knows anything at all about London he is aware that it is the best centre for teaching the veterinary, the medical or any other student. The institutions are numerous and, with the exception of the Royal Veterinary College, the best equipped in material and personnel. Of course I do not mean it to be understood that the teachers of the R.V.C., so far as they go, are not equal to those in other institutions. The teaching is lacking in many subjects that are taught in the best Continental schools, which are equipped in many respects better than the majority of medical institutions in this country. The R.V.C. cannot be better situated than it is, but it does not make the most of the *material* that is always surrounding it. There is no other centre surrounded with so many varieties or species of domestic animal, from Shire horses down to tame rats and mice. There is no doubt that, if money was forthcoming, either from the charitable or the State, or perhaps from both, it could be made the finest institution in the world and worthy of the centre of the Empire and of the commercial world.

On the Continent, even in small States, veterinary, and, for that matter, agricultural education and research are far in advance of that in English-speaking countries. Our four years' curriculum is only relatively equal to three years of theirs. This is due to the fact that the standard of the entrance examination is very much higher and includes these subjects which students in this country take for their first year's course, viz., biology and chemistry, as well as in other sciences which vary in character according to the State regulations. To bring our curriculum up to theirs we must either institute a five years' course or compel entrants to be in possession of the knowledge in which they are now examined at the end of the first year's course. If this latter course were adopted and a four years' course allowed to be in existence, many subjects not now in our curriculum could be taught, to bring our professiona! teaching up to that of other States.

Many in this country believe that if the Continental standard were insisted upon here we should not get a sufficient number of entrants to supply the country with veterinary surgeons. In discussing this question with some of the Continental teachers I was told that under their high standard they turn out more veterinary surgeons than can be found occupation. This is not due to the cheapness of the fees, because medical, law and other professional students all have to pay the same fees and have not to undergo any higher standard of education, entrance or otherwise.

In Holland, Belgium and other countries students are instructed in the diseases of poultry and other small economic animals, and since this was instituted, farmers more and more employ veterinary surgeons to advise them on the prevention or eradication of disease from their poultry yards. The students are not only taught poultry pathology, but also the zootechny of the fowl and rabbit, as well as of the other or larger domestic species. In France this subject has been taught for upwards of a century. How many of our men know the meaning of the term ? How many are there who know the various breeds of cattle and sheep, pigs, horses, goats, poultry, rabbits, etc. ?

This is done so that students (who are not now drawn from the agricultural community as much as formerly) shall go forth, knowing something about the various breeds of animals, their qualities, etc., they may encounter during the course of their practice.

The old-fashioned practitioner is fast becoming extinct ; his more immediate successors went to the dogs and now the future practitioner must take up poultry, if only as a side line, to eke out his existence. The poultry industry is greater than the wheat industry and there is no reason why it should not go on increasing tenfold. The cause of farmers not employing veterinary surgeons to advise about their poultry is the fact that, when they have asked them, the practitioners have replied that they " know nothing about fowl diseases." It used to be the same in regard to dogs and cats. Forty years ago very few practitioners would deign to look even at a dog and as for a cat, well—! What is said about poultry is, I am told, said concerning goats, which have now become very valuable animals.

I am glad to see that many of our profession are making excursions into other countries and seeing for themselves the up-to-date veterinary and agricultural institutions, dairies, slaughterhouses, etc. It is a *post-graduate* eye-opener. The more of these excursions the better for our practitioners who have, no doubt, studied Lord Bacon's Essay on Travel : " Travel, in the younger sort, is a part of education ; in the older, a part of experience. He that travelleth into a country, before he hath some entrance into the language, goeth to school, and not to travel."—Yours faithfully, HENRY GRAY, 1 Redfield Lane, Kensington.

The Editor acknowledges the receipt of the following :—

Communications from Dr. Tom Hare, Mr. W. Robb and Mr. W. R. Wooldridge.

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE : 10 Gray's Inn Square, London W.C.1.

All communications relative to the literary side of the Veterinary Record must be addressed to the Assistant Editor, " Veterinary Record," 10 Gray's nn Square, W.C.1

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